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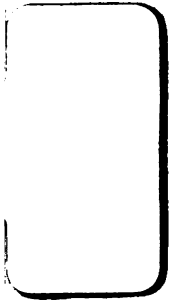
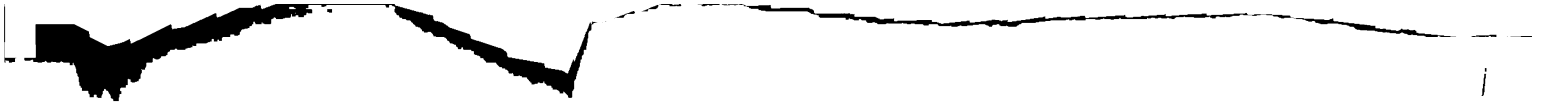




OBSERVATIONS

ON

MR. ARCHER'S

STATISTICAL SURVEY

OF THE

COUNTY OF DUBLIN.

BY

HELY DUTTON.

Dublin:

PRINTED BY GRAISBERRY AND CAMPBELL,
NO. 10, *BACK-LANE.*

1802.

284306

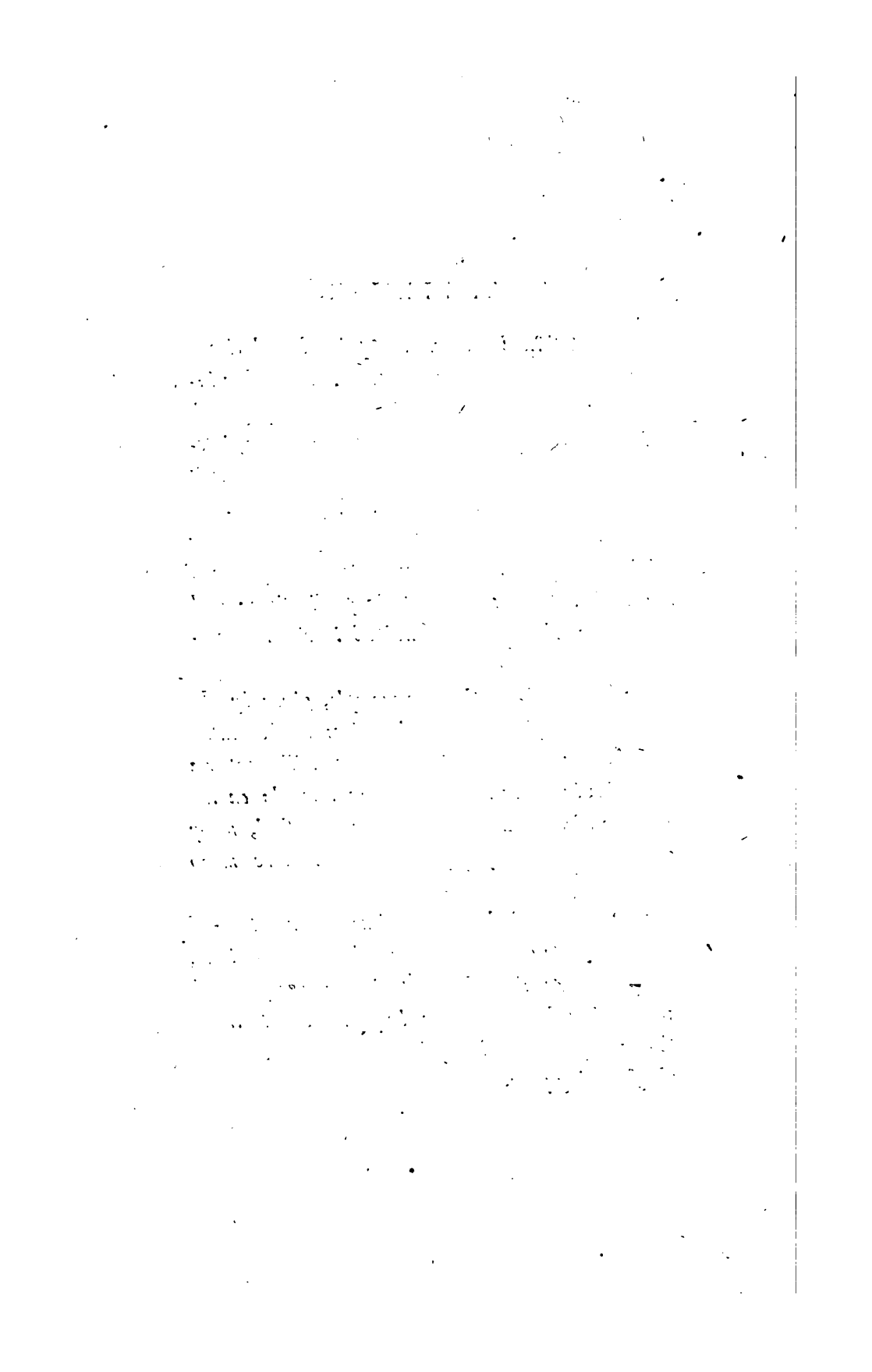
TO THE READER.

The Statistical Reports are printed and circulated for the purpose merely of procuring further information, respecting the state and husbandry of each district or county, and of enabling every one, interested in the welfare of this country, to examine it fully, and contribute his mite to its improvement.

The Society do not deem themselves pledged to any opinion, given by the authors of the Surveys, or of the Observations, made on their publications; and they desire, that nothing contained in either be considered as their sentiments.

The Society hope, that the example, given by the author of the following Observations on the Statistical Survey of the County of Dublin, will create an emulation in others to make similar remarks on the Surveys of other Counties, already published, many of which are very defective, and require much amendment.

The author of the Observations has not touched upon the state of the numerous charities, hospitals, and schools, public and private, in this county, which the Society hope will soon be forwarded to them, that a perfect Report may be formed in the course of the following year.



PREFACE.

WHEN, at the inſtance of a too partial friend, I was prompted to remark on the Statiſtical Survey of the County of Dublin, I imagined a very few pages would contain what I intended to ſay; but I found that more was expected than was at firſt propoſed, which has imperceptibly induced me to extend it to its preſent length. Had I the leaſt idea, when I began, that this would have been the caſe, every exertion ſhould have been uſed to make it more worthy of public inſpection; but it was really intended, at firſt, as a ſtimulus to others to communicate their obſervations on the different Statiſtical Surveys, which was much wanting, as the invitations

for

for this purpoſe, from the Dublin Society, have as yet had little or no effect. If gentlemen are determined to obſerve this ſilence, the Surveys muſt remain in a very imperfect ſtate, and fail in conveying to us and to poſterity the preſent ſtate, reſources, and means of improving the ſoil, and ameliorating the condition of the lower orders of the community. It muſt ſurely be extremely grating to the gentlemen, engaged in the different Surveys, to have to ſtate the neglect of anſwering letters, or refuſing to convey information; for, without the warm ſupport and active interference of the landed proprietors, it is utterly impoſſible to carry ſuch a work into execution with any beneficial effect.

It is earneſtly hoped it may be ſtill carried in mind, that this can be by no means conſidered as a Statiſtical Survey of the County of Dublin; if this had been the author's intention, he would have endeavoured to give it a very different appearance, and it would have been accompanied by a mineralogical map; for what Mr. Archer has

has written, and the preſent publication, are mere ſkeletons of a Statiſtical Report of the County of Dublin, which deſerves a more minute inveſtigation of its natural productions, and an infinitely greater number of ſuggeſtions for its improvement, than it has received.

It muſt be a matter of no little ſurprize and regret, that, in the whole city and county of Dublin, there could not be found one man of public ſpirit to undertake this moſt uſeful, pleaſing, and honourable taſk, *gratuitouſly*.

According to my ideas of its importance, it would take at leaſt two years to accompliſh this; and it could not be expected, that any profeſſional man, or one of ſmall income, would undertake it for the ſake of the trifling ſum the Dublin Society are enabled to offer; but ſurely there are many men of ample fortune, much leiſure, and competent abilities, to whom it would be a mere amuſement. When we ſee the elegant and ſatisfactory manner, in which the Kilkenny, Down, and ſome other

other Surveys are executed, we muſt regret that the ſame ſpirit did not actuate other gentlemen.

Great allowances muſt be made, in every Survey, for many omiſſions, and for defective or erroneous information, in a work that includes ſuch a great variety of matter; it requires no ſmall ſhare of aſſiduity to acquire ſuch information as will conduce to the end propoſed by the Society.

The diviſions recommended by the Dublin Society, and adopted by Mr. Archer, have been followed in the obſervations; if thought worthy of notice, they may, at any future period, be more eaſily found, and incorporated in a corrected Report.

Some gentlemen, who have ſeen my manuſcript, have objected to my ſtatement of the rent of land at 4*l.* per acre (page 2), as being too low. There are many farms in the county of Dublin, that do not let for near ſo high a rent; but it might as well have been five ſhillings or

ten

ten pounds an acre, as the ſame rent is charged in both courſes, and does not affect the concluſions I wiſh to draw from it.

It muſt be evident to every perſon, acquainted with rural affairs, that I have barely glanced at each ſubject; for were I to enlarge on the courſe of crops, roads, irrigation, cultivation of green crops for ſoiling in the houſe, draining, improvement of waſte lands, planting, hay-making, and ſome others, it would extend the work beyond the neceſſary limits; they are objects of ſuch conſequence, as each to require little leſs than a volume.

In page 14, a method of making potatoe-ridges is ſuggeſted, that is not commonly known, but, it is hoped, will be found highly deſerving of notice, eſpecially in this county, whoſe ſubſtratum is uſually compoſed of calcareous or other valuable gravels; but it muſt not be inferred from this, that I approve of planting potatoes in ridges in ſoils of a different nature; it is merely recom-

mended for lands where the gravel lies below the reach of the plough, even aided by the *miner*, and only to be practiſed on grounds, that have never received this improvement; after this operation, the plough and *miner* will be amply ſufficient to keep it ſo open, as to admit the propagation of carrots, or other tap-rooted plants. Planting potatoes in drills has been unequivocally proved to ſave labour, money, manure, and time, and to leave the ground in a much ſuperior ſtate of amelioration.

It may perhaps be imagined I am too ſevere in many inſtances, particularly on the practices of Fingal. The period has arrived, in which theſe vaunted practices are undeniably proved to be erroneous; therefore I ſhould deem myſelf extremely culpable, if I did not point them out; this is the more neceſſary, as, from being formerly eſteemed good farmers, they have acquired an opinion of their ſuperiority, that can only be changed by ſuch gentlemen as Mr. Segrave, who,

riſing

riſing ſuperior to vulgar prejudices, will at once confeſs himſelf in an error, and change his ſyſtem.

A circumſtance, that occurred lately, helps to throw ſome light on what I have juſt ſtated. A ſteward advertiſed that, amongſt his other acquirements, he was well acquainted with the *practices of Fingal*; on being examined, he maintained, that leſs than *ſix horſes in a plough could never anſwer in any ground*, and that *undoubtedly fallowing was abſolutely neceſſary, and ſuperior to any other preparation for corn.* Under the management of a man of theſe ſentiments, what improvement could be expected? That the ineſtimable value of green crops is beginning to be known, it may be neceſſary to ſtate, that I know an eminent grazier, who was formerly (as too many are yet) inſenſible of the value of any food for cattle but graſs and hay, who this year (1802) has upwards of *ſixty acres of vetches.*

Many of the errors I have pointed out in roads, and other parts of the ſubject, may have been

been amended ſince I ſaw them, of courſe my objections fall to the ground; but I fear they remain as I have ſtated. If any change in the ſyſtem takes place, it muſt originate in an act of the Imperial Parliament, that will throw the management of roads into the hands of *men, who have no other buſineſs to mind.* If canals had been carried on in this manner, what errors would have been committed?

I have ventured to give ſome hints to citizens poſſeſſing ſmall farms near the metropolis, but I fear to little purpoſe, as I have ſcarcely ever met one, that did not entertain the dangerous opinion, that farming is a ſcience eaſily underſtood.

In page 65 it is ſtated, that the difference between ſpring and winter vetches is not clearly aſcertained. I am ſince well informed, that Mr. Grainger of Cauſeſtown, in the county of Meath, and ſeveral other gentlemen, have unequivocally proved, by the ſeverity of laſt winter deſtroying the ſpring vetches, that a difference does actually exiſt;

exiſt; and, from a trial I have made this ſpring, I perceive they are eaſily diſtinguiſhable in every ſtage of their growth.

Although I have given the Black-rock road as an inſtance of bad management, it is not that others are conducted in a better manner, but merely becauſe it is more generally known.

On the ſubject of inland navigation, I have been honoured with the aſſiſtance of gentlemen perfectly maſters of the ſubject: as a matter of the utmoſt moment to the kingdom at large, and to the city of Dublin in particular, it will not be deemed, it is hoped, the leaſt acceptable part of the publication.

The extract from a pamphlet, publiſhed by the Right Hon. Edmund Burke, may be of ſome uſe in ſtopping the mouths of thoſe ignorant and diſſatisfied croakers, that we are obliged to liſten to every day; poſſibly it may alſo induce Government to prevent the unjuſt intermeddling of perſons in office in the ſale of hay and ſtraw in Smithfield

Smithfield market. I can ſcarcely imagine it is generally known, that farmers are *obliged* to ſell their hay before five o'clock in the evening; it ſeems a bell is rung at that hour, and they muſt inſtantly take their hay and ſtraw out of the market, and ſtand in the ſtreets, where thoſe in the ſecret are on the watch to buy at any price they chooſe to offer, which the poor frightened farmer is glad to accept of. This oppreſſive mode, I underſtand, was introduced by the late Lord Mayor, a well-meaning man, but entirely ignorant of agricultural affairs; I am ſurpriſed to ſee it permitted by the preſent Lord Mayor (Alderman Manders), who is a very ſpirited and good farmer; and it is equally ſurpriſing, that the farmers have not had recourſe to legal means to obtain redreſs.

The ſubject of minerals has been given at ſome length from Doctor Rutty and Doctor Blake; it is a very intereſting one, and, until lately, too much neglected.

I have

I have given ſome extracts from Mr. Tatham's Treatiſe on Irrigation, by means of *warping*; it is new in this country, and highly deſerving of notice, as there are many ſituations, that will admit of it.

Mr. Grierſon, with his uſual ſpirit, has been ſo good as to favour me with plates of his celebrated cattle and pigs.

From reading Mr. Culley's deſcription of the Suffolk punch horſe, I was induced to condemn the introduction of them into this country, but I am informed by a gentleman, who has taken pains to make himſelf acquainted with the ſubject, that twenty years ago the Suffolk punch was an animal very different from that deſcribed by Mr. Culley; he was about fifteen hands and an inch high, very broad, round in the rib, ſhort in the back, well ſhouldered, deep and wide in the cheſt, up before, his head well ſet on, and his legs broad, flat, and free from gum or hair; he was a quick ſtepper, and extremely well winded;

winded; his characteriſtic marks were his colour, which was a ſhade between ſorrel and cheſnut, with a mixture of white hairs in his mane and tail, an aquiline noſe, and rather a ſour countenance. Theſe horſes were admirably adapted for the carriage, the road, and the plough, and inſtances were not wanting of ſome of them turning out good hunters. By the miſtaken ſyſtem of enlarging the ſize of draft horſes, this valuable breed has been almoſt totally deſtroyed, and a large, aukward, mis-ſhapen animal (ſuch as Culley deſcribes) ſubſtituted in their place. A few of the good old ſort have happily been preſerved, by the exertions of a few ſpirited individuals, in Norfolk, Suffolk, and Eſſex; and this country is likely to be benefited by them, as Mr. Forteſcue of Raven's-dale, and Mr. Wynne of Hazlewood, have imported two ſtallions and ſix mares, of the very beſt kind that could be procured in England. No horſe is better calculated for this country, as he combines ſtrength and activity with hardineſs and thrift. The Suffolk punch, with

our

our little Iriſh mares, will probably renovate the breed of roadſters, for which Ireland was formerly celebrated, but which have degenerated by the introduction of Flanders waggon-horſes, and dwindled racers.

I beg leave to offer my ſincere acknowledgments to the different gentlemen, who have ſo kindly intereſted themſelves in the work. To General Vallancey's polite and unwearied attention I feel particularly obliged. I regret exceedingly, that ſeveral hints and corrections, with which I have been favoured, have been received too late for the preſent publication.

CONTENTS

OF THE

CHAPTERS.

CHAP. I.

		Page
SECT. 2.	*Divisions,*	1
3.	*Climate,*	11
4.	*Soil and Surface,*	13
5.	*Minerals,*	15
6.	*Water,*	18

CHAP. II.

AGRICULTURE.

SECT. 1.	*Mode of Culture,*	20
2.	*Extent of it, and of each Species of Grain sowed,*	24
	Course of Crops,	27

Page

Use of Oxen, - - - - 31
Nature and use of Implements of Husbandry, 33
Use of green Food in Winter, - - 37

CHAP. III.

SECT. 1. *Pasture,* - - - - 42
2. *Breed of Cattle—how far improved,* - 46
3. ——————*how far capable of further improvement,* - - - 47
Markets or Fairs for them, - - 55
Mode of Feeding, and how far housed in Winter, - - - - 57
7. *Natural Grasses,* - - - - 59
8. *Artificial Grasses,* - - - 65
9. *Mode of Hay-making,* - - - 74
10. *Dairies—their produce,* - - - 78

CHAP. IV.

SECT. 5. *General State of Leases,* - - 83
6. *Of particular Clauses therein,* - - 84
10. *Nature of Fences,* - - - 87
12. *Mode of Draining,* - - - 90
15. *Nature of Manures,* - - - 93

CHAP.

CHAP. V.

GENERAL SUBJECTS.

Page

SECT. 2. *Number and size of Villages and Towns,* 98

Some Observations on the Growth and Increase of the City of Dublin, - - 109

Gentlemens Seats and Improvements, - 118

3. *Habitation, Fuel, Food, and Cloathing of the lower Rank—their general Cost,* - 128

Price of Wages, Labour, and Provisions, - 131

6. *Use of Beer and Spirits—whether either, or which is encreasing,* - - - 133

7. *State of Roads, Bridges, &c.* - - 134

8. *State of Navigations and Navigable Rivers,* 148

13. *State of Farming Societies,* - - 151

16. *Plantations and Planting,* - - 155

18. *State of Nurseries within the County, and Extent of Sales,* - - - 157

20. *Quantity of Bog and Waste Ground,* - 158

21. *Possibility and means of improving them,* - 160

22. *Obstacles to them, and the best means of removing them,* - - - 163

27. *Whether the County has been actually surveyed, &c.* - - - - 166

29. *The Weight or Measure, by which Grain, Flour, Potatoes, &c. are sold,* - 167

Irrigation, - - 168

Horticulture,

Page

Horticulture, - - - - - 175
Burning Plants for Aſhes, - - 177
Saving Seeds, - - - - 178
An Extract from Thoughts and Details on Scarcity, by the late Right Hon. Edmund Burke, - - - 180

APPENDIX.

EXTRACTS FROM DOCTOR RUTTY'S ESSAY, &c. &c.

SECT. 1. *Of Marle*, - - - - - 3
2. *Of Sand, and its Varieties and Uſes in Agriculture, and for Mechanical Purpoſes, &c.* 9
Of Sea-Sand as a Manure, - - 10
3. *Of Clay*, - - - - 13
Limeſtone-gravel, - - - 16
Of the Gypſum, - - - 19
4. *Of Rotten Stones, with an Analyſis of them*, 20
Of the Lapis Hibernicus, - - 21
Of Ochres and painting Earths, - - 26
Iron Stones and Iron Ores, - - 30
Of Vitriol, - - - - - 33
Spars, Petrifications, Cryſtals, and Baſtard Gems, - - - - 34
Of Cryſtals, - - - - 40
Of Limeſtone, - - - - 41
Of Marbles, - - - - 46
Of the Baſanite, or Touchſtone, - - 48

Of

Page

Of Slate, and the Building-ſtone of Dublin, a Sympexium or Rock-ſtone of HILL, - 48

Of the Building-ſtone of the County of Dublin, 52

Obſervations on Calp, by the Hon. George Knox, M.R.I.A. - - - 60

Of Flints, and other Stones akin to them, - 67

Of Porphyry, - - - - *ib.*

Of the Granite, vulgarly called Fireſtone, - 68

Of Mill-ſtones, - - - - 70

Of Lead Ore, - - - - 71

Copper Ore, - - - - 75

A ſhort Account of Minerals, collected and preſented by Robert Blake, M.D. to the Dublin Society, - - - 77

A Liſt of Articles dependant on Agriculture, imported into Ireland within the laſt ſeven years, - - - - 86

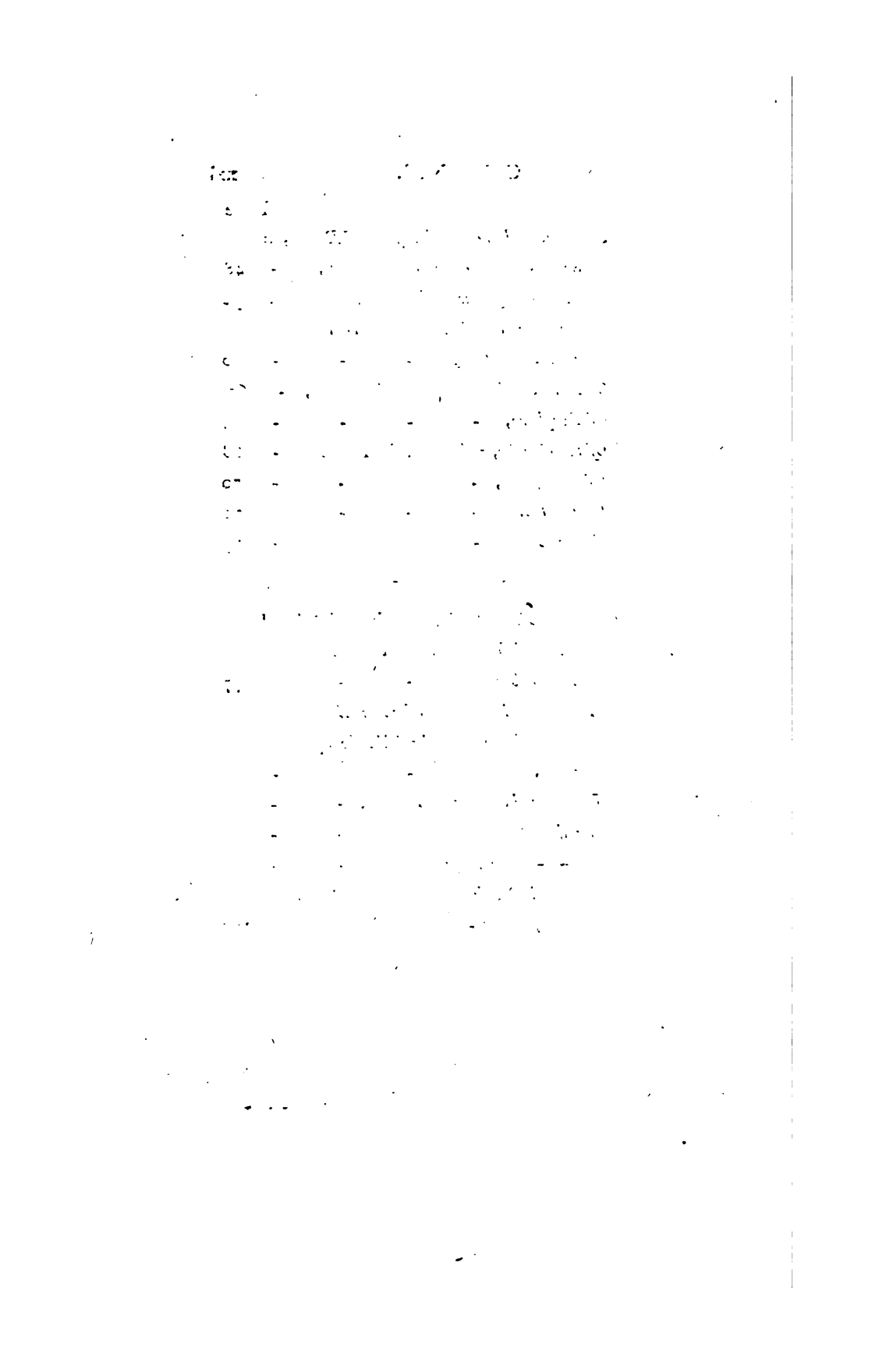
Irrigation, by means of warping, - - 89

Canals.—The Grand Canal, - - 98

———*The Royal Canal,* - - 117

Improved Breeds of Leiceſterſhire Cows and Pigs, - - - - 125

STATISTICAL



OBSERVATIONS

ON

THE STATISTICAL SURVEY

OF THE

that the high rents near the metropolis would not anſwer for the propagation of corn. Doubtleſs, if the old huſbandry of Fingal was purſued, of fallow, wheat, oats, oats, almoſt all the hay and ſtraw ſold off the land, no dung drawn from Dublin to it, little or no clover or green crops of any kind cultivated, except a few potatoes, no cattle houſed winter or ſummer, Mr. Archer's poſition would be very juſt. If, on the contrary, the moſt ſpirited practices of the improved agriculture are purſued, corn crops will be found much more advantageous than hay or paſture, as either of

theſe, according to the *preſent ſyſtem of management, do not improve the land;* but by the improved mode the fertility of the ſoil is annually encreaſed. I ſhall *attempt* a ſtatement of the expence and profits of the two modes, which may perhaps be of ſome uſe to farmers, as well as to gentlemen, who farm for amuſement near the metropolis.

OLD METHOD.

EXPENCES OF AN ACRE.

Firſt Year—HAY.

	£.	s.	d.
Rent, - - - -	4	0	0
Manure from Dublin, at leaſt -	20	0	0
Mowing and making eighteen loads, -	0	18	0
Loading and drawing to market, -	1	19	0
Tythe, - - - -	0	8	0
Drawing home and ſtacking, - -	0	10	0
Picking ſtones, rolling, and buſh-harrowing,	0	4	0
Commiſſion and expences, - -	0	10	0
	£.28	9	0

	£.	s.	d.			
Produce 18 loads (4¼cwt.) at 18s.	16	4	0	19	4	0
After-graſs, - - - - - -	3	0	0			
Loſs per acre,				£.9	5	0

Second

Second Year—HAY.

	£.	s.	d.
Rent,	4	0	0
Tythe,	0	8	0
Mowing and making,	0	18	0
Drawing home and ſtacking,	0	10	0
Loading and drawing to market,	1	19	0
Commiſſion and expences,	0	10	0
	8	5	0
Produce 18 loads at 18*s.* 16 4 0			
After-graſs, 3 0 0	19	4	0
Profit,	£.10	19	0

Third Year—HAY.

	£.	s.	d.
Rent,	4	0	0
Tythe,	0	8	0
Mowing and making,	0	14	0
Drawing home and ſtacking,	0	7	0
Loading and drawing to market,	1	10	4
Commiſſion and expences,	0	7	0
	7	6	4
Produce, 14 loads at 16*s.* 11 4 0			
After-graſs, 2 0 0	13	4	0
Profit,	£.5	17	8

Fourth Year—HAY.

	£.	s.	d.
Rent,	4	0	0
Tythe,	0	6	0
Mowing and making,	0	10	0
Drawing home and ſtacking,	0	5	0
Loading and drawing to market,	1	1	8
Commiſſion and expences,	0	5	0
	6	7	8

	£.	s.	d.		
Produce, 10 loads at 12s.	6	0	0	7	5 0
After-graſs,	1	5	0		
Profit, £.				0	17 4

RECAPITULATION.

	£.	s.	d.
Profit, 2d year,	10	19	0
Ditto, 3d year,	5	17	8
Ditto, 4th year,	0	17	4
	17	14	0
Loſs the 1ſt year,	9	5	0
Total profit, £.	8	9	0

IMPROVED

IMPROVED COURSE.

We will ſuppoſe the land to be in the ſame ſtate as when it received the dunging for the meadow, the ſame quantity of dung uſed, and at the ſame price.

Firſt Year—Potatoes in ridges in the uſual mode.

				£.	s.	d.
Rent,	-	-	-	4	0	0
Dung,	-	-	-	20	0	0
Seed potatoes, nine barrels at 10*s.*				4	10	0
Cutting,	-	-	-	0	4	6
Planting,	-	-	-	4	0	0
Second ſpitting and ſhovelling,				1	0	0
Weeding,	-	-	-	0	4	0
Digging up,	-	-	-	6	10	0
Sorting, picking, and pitting,	-			0	10	0
Selling at market, and expences,				4	10	0
				45	8	6
* By 80 barrels (20 ſtone each) of early potatoes, at 10*s.* 10*d.* per bar.	£. 43	*s.* 6	*d.* 8	51	9	2
20 do. apple potatoes, at 8*s.* 1½*d.*	8	2	6			
Profit,				£.6	0	8

About

* As it is probable the potatoes will be dug very early, perhaps four times that ſum may be obtained, and the earlier they are dug, the ſtronger the rape will be.

About the beginning of June a ſeed-bed of good mould ſhould be prepared; a few perches of one of the potatoe-ridges manured will anſwer, and about two quarts of rape-ſeed ſowed for each acre; this will probably be more than is neceſſary; but it is better to have ſome to ſpare, as a poor man may always diſpoſe of any redundancy to his neighbours, and a rich one may diſtribute them gratis amongſt his poor tenants; if no better motive actuates him, it will prevent pilfering. Theſe plants ſhould be drawn from the thickeſt places, and planted in the potatoe-ridges daily as faſt as the potatoes are dug; for this I ſhall take Mr. Archer's eſtimate.

*Firſt Year—*RAPE.

	£.	s.	d.
Seed, - - - -	0	1	0
Digging the ground and ſowing, -	0	6	0
Planting, at ſixteen inches aſunder, -	1	14	0
Cutting and carrying to cattle, - -	1	0	0
	£.3	1	0

	£.	s.	d.
Produce 20 ton, 10*s.* per ton,	10	0	0
	3	1	0
Profit,	£.6	19	0

Second

Second Year—BARLEY.

	£.	s.	d.
Rent, - - - - -	4	0	0
Seed barley, 16 ſtone, - - -	0	16	0
Clover-ſeed, 21 lb. - - -	1	10	0
Reaping, binding, and carrying home, -	0	14	0
Threſhing 16 barrels at 8*d.* per barrel, -	0	10	8
Winnowing, - - - -	0	2	0
Drawing to market and commiſſion, -	0	14	1
Tythe, - - - -	0	6	0
Ploughing, harrowing, and ſowing, -	0	8	0
	£.9	0	9
Produce 16 barrels at 16*s.* £.12 16 0			
9 0 9			
Profit, £.3 15 3			

Third Year—CLOVER.

	£.	s.	d.
Rent, - - - -	4	0	0
Picking off ſtones and rolling, - -	0	10	0
Cutting and carrying green clover, -	1	0	0
	£.5	10	0
Produce green for cattle, horſes, &c. ſuppoſing it only equal to that made into hay, but it is infinitely more profitable; or ſuppoſe we value it as rape, - - - - -	10	0	0
Profit,	£.4	10	0

Fourth

Fourth Year—WHEAT.

	£.	s.	d.
One ploughing, harrowing, and ſowing,	0	12	0
Rent,	4	0	0
Seed, ten ſtone,	0	17	6
Shovelling,	0	5	0
Tythe,	0	8	0
Making and drawing home,	0	13	0
Threſhing ten barrels,,	0	10	0
Winnowing and drawing to market,	0	12	0
Commiſſion and expences,	0	2	8
	£.8	0	2

Produce 10 barrels, 35*s.* per,	£.17	10	0
	8	0	2
Profit,	£.9	9	10

RAPE.

	£.	s.	d.
Expences as firſt year,	3	1	0
Dung 80 one horſe car-loads,	4	0	0
	£.7	1	0

Produce 25 ton, at 10*s.* per,	£.12	10	0
	7	1	0
Profit,	£.5	9	0

RECAPITULATION.

RECAPITULATION.

		£.	s.	d.
Profit 1ſt year,	potatoes,	6	0	8
Ditto, ditto,	rape,	6	19	0
Ditto, 2d year,	barley,	3	15	3
Ditto, 3d year,	clover,	4	10	0
Ditto, 4th year,	wheat,	9	9	10
Ditto, ditto,	rape,	5	9	0
	Total profit,	£.36	3	9
	Profit of the old ſyſtem,	8	9	0
Improved corn ſyſtem ſuperiority,		£.27	14	9

It muſt appear to any perſon the leaſt converſant with agricultural calculations, how very difficult it is to draw any ſatisfactory concluſions from any data, however correct; the endleſs variations in the expenditures and receipts muſt make all ſuch calculations liable to many errors; but I truſt it will be evident to every perſon not afraid to open his eyes to the new lights of agriculture, that I have made every item lean rather againſt my ſtatement than otherwiſe, and that I have left very ſufficient room for many deductions, and ſtill enough will remain to ſhew the little foundation for Mr. Archer's aſſertion, that the "high rents near the city would not anſwer for corn." The moſt material part of the compariſon remains to be conſidered,

ſidered, which leaves the ground at the end of the fourth year in the moſt profitable ſtate. Meadow in the fifth year will not ſhew much good effects from the dung it received the firſt year, and, if it has been kept in paſture, it will be but little improved; for if paſturing ground had that extraordinary effect, that many are apt to think, it would annually encreaſe in fertility; but a moment's recollection will ſerve to convince us that paſtures (for inſtance, commons), that have been continually grazed, are at this day little or nothing richer than they were a century ago; beſides, in the old ſyſtem, at the end of the fourth year, as the produce has been ſold off the land, there will be little or no dung accumulated to reſtore the fertility.—Let us now take a view of the improved tillage ſyſtem; there not only remains a very handſome *annual* ſuperiority in caſh of 6*l.* 18*s.* 8*d.* per acre, but what is of vaſt importance, and which is too often overlooked, the ground has received *two* dungings; and from the great quantity of green food for feeding in the houſe, a very large quantity of dung will be ready for potatoes as ſoon as the laſt crop of rape is conſumed, as all the ſtraw of each crop has been *uſed on the land.* It will be eaſily ſeen, that the courſe has been accommodated to the conception and practices of the commoneſt farmer, and by no means what may be eſteemed the moſt beneficial courſe, that could be purſued ſo near the metropolis, where the ready market for all redundancy

daily

daily preſents itſelf; for I am well convinced, many green crops, that I could point out, would be infinitely more profitable, but I thought it beſt to give that courſe, of which every farmer knows the expences and profits.

SECT. 3. *Climate.*

THE wetneſs of our climate is the conſtant theme of all thoſe, who are little acquainted with rural affairs; one would be tempted to imagine, that they thought the climate ſhould be made to ſuit the convenience of the good citizens of Dublin alone. If the climate was as dry as thoſe we hear ſo often laviſhly praiſed by travellers, what would ſupply us in dry ſummers with that plenty of water we are uſually bleſſed with? Or if the quantity of moiſture was not equal to the abſorption of our in general rocky or gravelly ſoil, what would feed our numerous flocks and herds, or give us that abundance of that ineſtimable root of plenty, the potatoe? Thoſe, who have never been out of the county of Dublin, are too apt to form an opinion of the reſt of Ireland from our poor clayey ſoil; but it is a very erroneous one, and, if we make a proper uſe of our advantageous ſituation, no ſoil can be more proper in the neighbourhood of a great and populous city. Can any ſoil anſwer better for the ſweepings of our ſtreets, or our ſea-

coal aſhes, which would be not ſo beneficial to gravelly or ſandy ſoils? Poſſibly it is not generally conſidered, that all the manures we poſſeſs in abundance in this county are peculiarly adapted to the improvement of clay ſoils, viz. lime, limeſtone-gravel, marle, ſweepings of the ſtreets, coal-aſhes, ſea-ſand, &c.

The ſtrong breezes from the weſt, with which our city is favoured, always come in for a ſhare of the odium attached to our climate by the croakers; they do not reflect, that a gentle breeze would not have power to diſperſe the ſmoke and vapour of Dublin. Upon the whole few cities poſſeſs ſo many advantages, or ſo healthful a ſituation, whether we conſider the almoſt conſtant current of air from the weſt to the eaſt, which paſſes through the city, aided by the flux and reflux of the tide, the great advantage of a conſtant ſtream of water to carry off all the filth collected by the ſewers, and numberleſs other happy circumſtances, which we ſeem ſcarcely to notice, or are very unthankful for to Providence. The air of Dublin has been much improved within a few years, the ſtreets are conſiderably widened, and numberleſs obſtructions removed, and the complaints of dirty ſtreets have not *ſo much* foundation now as formerly. If the inſpectors of nuiſances did their duty, we ſhould have ſtill leſs cauſe of complaint, but it ſeems theſe gentlemen pay little attention to their buſineſs, as the foot-paths are permitted very frequently to remain in the moſt filthy

ſtate;

ſtate; as I am informed they have a ſhare in the fines levied for not cleaning before houſes, I am at a loſs to account for the neglect. Inſtead of receiving a ſalary, a ſpirited execution of the duties of the office would enable a perſon to pay a very handſome ſum for permiſſion to make the citizens of Dublin cleanly.

The great improvements in land near the city have operated as another means of removing nuiſances quickly, and, by a moſt ſalutary regulation, the ſweepings of the ſtreets muſt be removed beyond the circular road. If all church-yards, ſlaughter-houſes, chandlers, ſoap-boilers, and other nuiſances were removed out of the city, Dublin would be ſuperior to any city in Europe. "Let raſh, gloomy, and ungrateful mortals then forbear to murmur at this climate, ſince it is evident the bounty of Providence cauſeth the ſun to ſhine upon us in a far greater degree than we commonly imagine or deſerve."

SECT. 4. *Soil and Surface.*

THOUGH the ſoil of the greater part of the county of Dublin is inclined to clay, it is not like thoſe deep and tenacious clays ſo frequent in many parts of England; for ſcarcely any part of our ſoil but has a mixture of gravel, and almoſt every where, if farmers will be at the

the pains to ſearch for it, it will be found that, at no very great depth, they poſſeſs limeſtone or other beneficial gravels, with this uncommon advantage attending it, that the operation of draining the ground generally raiſes a ſufficiency of gravel to manure the whole ſurface. Great improvements have been made in many parts of the county by this practice; and where great caution is obſerved in the mode of *filling in* the drains over the ſods or other materials, with which the drains are conſtructed, the practice, aided by the great facility of procuring manures from Dublin and elſewhere, muſt tend to counteract the bad effects attendant on retentive ſoils. For a more particular account of the method of draining wet lands, ſee Chap. IV. Sect. 12.

Planting potatoes in ridges has been in deriſion called by our neighbours the Iriſh lazy-bed method; but I am convinced, in retentive ſoils with a gravelly bottom, ſuch as we generally find in the county of Dublin, it is the moſt beneficial practice that could be purſued. To make this anſwer the purpoſe of preventing coheſion, it ſhould be continued for three years; this may be eaſily effected by making the ridge ſix feet wide, and the furrow three feet the firſt year; the ſecond year half the ridge ſhould be made the furrow, and the third year the other half; by which means in three years the whole field would be completely trenched. If the gravel lies below the uſual depth of potatoe-furrows, it ſhould be dug for, and well

well mixed with the ſurface, which by this means will become porous; even where the bottom is not good enough to bring to the ſurface, it will be found highly uſeful to looſen the bottom of the furrows in all retentive ſoils; and if, inſtead of the uſual mode of running the ridges in the direction of the ground, they were made diagonally to the fall of the ground, they would in ſome meaſure ſerve as drains.

SECT. 5. *Minerals.*

LIMESTONE-GRAVEL abounds in almoſt every part of this county, but is by no means uſed in that quantity it ought; there is the leſs excuſe for this, as generally the ſoils, which moſt abound with it, are thoſe that want it moſt on the ſurface. There is a kind of black gravel very frequently to be met with, of a very fertilizing nature; it generally paſſes under the denomination of limeſtone-gravel, but Mr. Kirwan informs me it is not calcareous; however, let its component parts be what they may, its very beneficial properties are well eſtabliſhed.

Marle abounds in many parts of the Dublin mountains, and elſewhere; but though its operation on heathy or boggy ſoils is well eſtabliſhed, yet the inhabitants of thoſe waſte tracts make little or no uſe of it; that its value

value was formerly well known is evident, by many old pits being found in different parts of the mountains.

From the accounts given by Mr. Archer, and Mr. Donald Stewart, itinerant mineralogiſt to the Dublin Society, it would ſeem, that we have a very great variety of the mineral kingdom in our county; but it is ſurely a ſtrong proof of the moſt extraordinary neglect of the proprietors, that the hints given by them, and by Doctor Rutty many years ſince, have never been purſued with ſpirit. The expence of a ſet of boring tools could be no object, and the trouble would alſo be very trifling. As Mr. Archer has made the very liberal and ſpirited offer of pointing out previouſly, where it is likely they may be found, ignorance of the probable ſituation or method of ſearching cannot be pleaded in excuſe. I know not how to account for that very blameable careleſſneſs and want of ſpirit in our landholders, that prevents their taking every advantage of the bounties of Providence, ſo laviſhly thrown under their feet unheeded.

Few cities, I believe, have a greater variety of ſtones for the purpoſe of building; for there is no part of the vicinity, that does not produce both limeſtone and others for this purpoſe, and if the extenſion of the city ſhould at any time cauſe a ſcarcity, the ſouth ſide preſents an inexhauſtible fund of mountain granite; and I imagine, in a climate ſo moiſt as ours, more uſe

ſhould

ſhould be made of this kind of ſtone than many that are uſed, which imbibe and retain moiſture in a greater degree than our mountain granite; it poſſeſſes, in a very eminent degree, the deſirable property of remaining unchanged for ages by every viciſſitude of climate, which is what can be ſaid of very few other kinds; witneſs the College library, the greater part of our churches, the new gaol, and moſt of our public buildings; it is alſo peculiarly fit for flagging our ſtreets, as the roughneſs of its ſurface prevents the feet from ſlipping; it likewiſe ſtands fire better than any other we poſſeſs. The difficulty of ſplitting this ſtone was formerly an objection; but as moſt workmen know, that driving wedges in the direction of the flakes of mica rends the ſtone tolerably regular, the buſineſs is now more eaſily accompliſhed; beſides, this ſtone is eaſier dreſſed freſh from the quarry, as it hardens in the air.

Slates have been found in ſome parts of this county, but they were too porous, and did not ſplit into laminæ thin enough for the purpoſe of covering houſes; it is not improbable that, if they were quarried from a greater depth, the quality might be much improved; for in general all quarries are harder, the deeper they are worked.

We are given to underſtand by Mr. Archer and Mr. Stewart, that there is every likelihood of finding coal in the following places, viz. Porter's-town on the

Royal canal, Hill of Howth, Garriſtown, Lambay iſland, and the Naul, yet I cannot find that any ſpirited attempt has been made by the proprietors to aſcertain it.

SECT. 6. *Water.*

THE bar acroſs our harbour prevents the admiſſion of veſſels of a great draft of water, and has been adduced as a ſtrong reaſon for conſtructing a canal from Dalkey to the Grand canal docks near Ringſend, which would admit veſſels of more than twice the burthen of thoſe, that can paſs the bar.

The dangerous ſtate of the walls on each ſide of the river Liffey calls loudly for amendment; I do not know in whoſe department ſuch repairs are, but their preſent ruinous ſtate does them little credit; and every perſon, the leaſt acquainted with ſuch affairs, muſt perceive, that neglecting to ſtop a breach of very ſmall dimenſions in time, and which would coſt only a few ſhillings, occaſions the expenditure of a large ſum at a future period.

Another very great neglect is, permitting the accumulation of a large heap of rubbiſh in the river Liffey, behind the fountain on Ormond-quay; every flood waſhes part of it away, and as oyſter-ſhells and other rubbiſh from Ormond-market form a great part of it, it will at

ſome

ſome future period cauſe an obſtruction to the current, or may be thrown by it where it will be very injurious to the ſhipping; if inſpectors of nuiſances did their duty, this would have been prevented long ſince.

The docks at the new cuſtom-houſe, it is now perceived, are not by any means adequate to the increaſe of trade, as veſſels are obliged to lie many tier deep, which is exceedingly inconvenient to merchants and to the ſhips; this can be only remedied by building another more capacious dock to the eaſt of the preſent one, where a ſtone-cutter has his yard; I imagine this could be effected at a moderate expence, as little excavation is neceſſary, and the wall next the river is already built.

Turning the courſe of the river Dodder to the eaſt of Iriſhtown was a very favourite idea ſome years ſince; for what reaſon it was not carried into execution I am ſtill to learn; it has been long complained of as accumulating a bank of ſand, that obſtructed the ſhipping in their paſſage up and down the river; by a great deal of expence and labour this has been for the preſent a good deal removed, but muſt ſtill accumulate. I am informed the levels, for the purpoſe of turning this river, were taken ſome years ſince, and reported *impracticable*; I am convinced it is perfectly practicable, and, if applied to, will point out the line, and method of conducting it.

CHAP. II.

AGRICULTURE.

SECT. I. *Mode of Culture.*

IT is recommended to "depaſture the firſt growth of clover until the latter end of May, and mow the ſecond in the latter end of Auguſt or beginning of September." This is contrary to the practice of the beſt agriculturiſts of England, and it will be found a great waſte of clover to permit beaſts of any kind to paſture it; the moſt economical way of uſing it is certainly for ſoiling *in the houſe*, as it not only goes at leaſt three times as far, but an immenſe quantity of manure is accumulated, and dung *made in ſummer*, from the great quantity of urine, and from its fermenting ſooner, and with more certainty, is much more valuable than that made in winter.

Clover, after having been paſtured on, is of very unequal growth, unleſs eat too bare for the thriving of ſtock; ſome of it is in flower, whilſt others are only juſt

juſt beginning to ſhoot, conſequently can never anſwer the purpoſe of a ſecond crop for either hay or for ſeed; and indeed it will be found a great waſte to ſave any of it for hay, but to give it all green in the houſe. If the farmer chooſes to ſave any part for ſeed, the previous cutting ſhould be as early as poſſible, to allow the ſecond time to ripen the ſeed, and he need not be apprehenſive of its ſhedding, as it is with ſome difficulty made to quit the ſeed-pod.

Many experienced agriculturiſts doubt whether borecole, or any other kind of vegetable, will ſucceed between the drills of *late* potatoes, as their rambling manner of growth renders them very unfit for this purpoſe, and their ſhade uſually makes plants between them unable to bear expoſure to winter cold. If planted between the drills of potatoes *dug early* for market, it may anſwer very well; but if planted between the rows of beans, they will be found to anſwer much better, as the beans are generally reaped or pulled early enough to afford an opportunity of landing the borecole or rape with the plough, an advantage which cannot eaſily be obtained from *late* potatoes, which are ſeldom taken out of the ground until November.

In page 17, the courſe of crops purſued by Mr. Lenahan, Mr. Johnſon, and Mr. Segrave, deſerves to be held up as an example of defective huſbandry, as

theſe

theſe gentlemen are looked up to, and followed cloſely, by the farmers in Fingal.

Surely it muſt be aſtoniſhing that, in this enlightened period of agriculture, men ſo near the metropolis, who muſt mix in the ſociety of many, who purſue different ſyſtems, and who do or ought to know, that very different practices are followed by the beſt agriculturiſts in England and Ireland, ſhould ſtill perſiſt in the ſame mode of cropping that their great grandfathers did; perhaps they are above being inſtructed *from books*, as I have heard many farmers ſay they would not give a ruſh for all the books on the ſubject, and that they would rather take the advice of their ploughman, a muliſh race of men, that would ſooner perhaps leave their ſervice, than plough *land* with leſs than four bullocks! A very pretty agricultural preceptor, much ſuperior, no doubt, to Mr. Young, Doctor Anderſon, &c. &c.

We will ſuppoſe Mr. Segrave has only three hundred acres out of four hundred under tillage, the profit on which, by his courſe of cropping, *according to Mr. Archer*, is 1*l.* 8*s.* per acre; this, in four years, amounts to 1,680*l.* By the improved huſbandry, the profit on this number of acres will be 8,570*l.* 12*s.* 6*d.* which leaves a balance againſt Mr. Segrave, in four years, of no leſs than 6,890*l.* 12*s.* 6*d.* beſides the rapid improvement his land is ſtill making. Probably the old hackneyed argument of prejudice and ignorance may be uſed here (not, I am convinced, by Mr. Segrave), "that

" that theſe profits are only *on paper;*" but it would be no difficult matter to prove (as it has been often done) that they can alſo be *put in the pocket.* It is probable Mr. Segrave has more of his land under tillage than I have ſuppoſed, which makes his loſs, by perſiſting in this ruinous courſe, ſtill greater. I have too good an opinion of Mr. Segrave's good ſenſe, to be apprehenſive he will be offended at theſe well meant hints; if they make him ſow *one acre of winter vetches*, or plant *one acre of rape*, I ſhall think myſelf amply rewarded; the profit on theſe *two acres* will ſpeak to him in more perſuaſive language that any I can make uſe of.

In many places the uſe of only two horſes in a plough (but ſtill a driver) has obtained very much; but ſo prejudiced are moſt ploughmen, that I have often ſeen, in the adjoining field, four horſes or oxen uſed, although the ground was in every reſpect alike.

It is ſurpriſing that kitchen gardeners, who are always complaining of high rents and the great expence of labour, do not uſe the plough inſtead of the ſpade; the ſaving would be very great, and the ground much better cultivated.

The late Mr. Chriſtopher Brangan, of Swords, was an exception to the general mode of culture in the county of Dublin. I ſaw, about three years ago, at his farm at Collins-town, *at one time*, potatoes in drills, ſet and taken up by the plough; vetches for ſoiling horſes; red clover for the ſame purpoſe; red clover

ſowed

ſowed amongſt flax, &c. This farm is adjoining to Mr. Domville's farm of Cold Winter, near the foreſt, and, when I firſt ſaw it, was in the ſame wretched, wet, commonlike ſtate, in which this gentleman chooſes to keep his different farms in the county of Dublin. Mr. Brangan made *underground* drains, ſpread lime-ſtone-gravel and other manures, and left it one of the beſt farms in Fingal; it is more than probable it will now fall into the old darling courſe, wheat and oats, wheat and oats, until completely exhauſted.

SECT. 2. *Extent of it, and of each Species of Grain ſowed.*

THERE is reaſon to apprehend that, inſtead of agriculture receiving any benefit from the late exertions of farmers to break up graſs-lands for different kinds of corn crops, it will receive an injury proportionate to the erroneous method of cropping. If farmers could be prevailed on to aboliſh their wretched ſyſtem of fallowing, and purſue the *alternate* courſe of cropping, I ſhould be glad to ſee every inch of land in the county of Dublin broken up for tillage; but, until that ſyſtem is generally adopted, breaking up graſs-lands cannot be conſidered advantageous. A very happy change has lately taken place in the ideas of *enlightened* graziers; they now begin to perceive the very great benefit

neſs of green winter crops, but ſtill too many are inſenſible of the ſuperiority of a crop of rape, or potatoes, to one of rotten graſs, the boaſted winter food of many of our beſt grazing counties, and they ſeem to be equally inſenſible of the ſuperior profit of an ameliorating courſe of crops, that will ſupport more cattle than their beſt lands in their preſent ſtate; for, until lately, it was no uncommon thing for graziers poſſeſſing three or four thouſand acres to have only forty or fifty acres under tillage. Doubtleſs this aſſertion may ſurprize many of them; but I imagine very little calculation would ſerve to ſhew them the fallacy of their ideas, and that tyrant cuſtom only can be pleaded in excuſe.

Nothing can tend more ſtrongly to ſhew, how little they know of the improved ſyſtem, than the notes we have ſometimes ſeen attached to advertiſements of land to be ſet; "a convenient place to throw manure into the river." As theſe notes have been for ſome years diſcontinued, it is hoped it has proceeded from a conviction, that their ſyſtem was inferior to the preſent improved one.

Rapid improvements are now taking place, becauſe men of fortune and liberal education have at length turned their thoughts to the plough; before this little improvement could be expected, as the tillage was moſtly in the hands of thoſe, who were not able or did

not know how to improve it; but as landed proprietors have ſhaken off a good deal of that lazineſs attendant on the grazing ſyſtem, great improvements may be expected, and they will find that their lands will ſupport *more cattle*, and at *the ſame time* produce great crops of corn, which is the great ſuperiority of the improved huſbandry, beſides giving employment to multitudes, that are now idle or half employed, which is a matter of the utmoſt conſequence.

It is not an eaſy matter to aſcertain the average produce of each kind of grain from the acre; it was formerly, I believe, eſtimated at ſix barrels of wheat of twenty ſtone each; ten barrels of oats of fourteen ſtone each; and nine barrels of barley of ſixteen ſtone each: but I am convinced that, from the great extenſion of the potatoe culture, and in ſome places clover, the average has been raiſed to eight barrels of wheat; twelve barrels of barley; and fourteen barrels of oats: the leaſt doubt does not remain, that a ſpirited adoption of the improved huſbandry will ſtill conſiderably encreaſe the average; and, as an inducement to make ſome exertions, I annex a ſtatement, from men of high character, of what has been produced in land in high condition; and at the ſame time it helps to prove, that the produce will amply repay a ſpirited agriculturiſt for almoſt any expenditure of money.

Young's

			Barrels.
Young's Eaſt. Tour,	vol. I. p. 416.	Oats per Ir. acre	$29\frac{5}{14}$
——— Annals of Agr.	vol. II. p. 159.	Ditto.	$29\frac{1}{2}$
——— Ditto.	vol. V. p. 240.	Ditto.	$30\frac{9}{14}$
——— Eaſt. Tour,	vol. I. p. 401.	Barley,	$25\frac{11}{16}$
——— Ditto.	vol. III. p. 19.	Ditto.	$28\frac{1}{16}$
——— Annals of Agr.	vol. II. p. 79.	Ditto.	29
——— Ditto.	vol. II. p. 243.	Wheat.	$18\frac{7}{8}$
——— Ditto.	vol. XII. p. 45.	Ditto.	$19\frac{14}{16}$
——— Ditto.	vol. II. p. 93.	Ditto.	$21\frac{1}{16}$

On my late father's farm near Mallahide I have ſeen thirty-three barrels of very fine wheat *ſold* off two acres of ground, which had not been manured in the memory of man, and produced a crop of oats the preceding year; the quantity of ſeed ſowed was only two buſhels; this has been frequently exceeded in Ireland, and ought to ſtimulate farmers to make exertions; for ſurely it muſt be a wretched ſyſtem of cropping, that permits land of this fertility to remain every third year worſe than unproductive, and ought to open their eyes to the ruinous courſe they are blindly purſuing.

Courſe of Crops.

In page 21 it is recommended to plant rape after potatoes, in the beginning or middle of September, about ſix or eight inches aſunder. Rape plants, ſowed in

June, will *by this time*, if they have been tranſplanted, cover much more than that ſpace of ground; they ſhould therefore, if planted the beginning of September in rich ground, be at leaſt eighteen inches aſunder; but, if not planted until a month later, a foot will be ſufficient. It is of great conſequence to give theſe, and indeed all plants, room, as they become *very full in the middle, and much thicker in the leaf*; and although they may not appear *to the eye* ſo large a crop, they will be found vaſtly ſuperior *in the ſcales*.

It would be a great advantage, if near a market, to dig early potatoes *daily*, as it not only makes the work, by dividing it, lighter, but gives an opportunity to women and children to plant as much with rape each evening or morning, as had been cleared of potatoes the previous day, whilſt the plough or ſpade is taking up more, and which will be ready for the women and children by the time they have planted out the rape. As it is of very great conſequence they ſhould be planted as ſoon after the ground is ſtirred as poſſible, it would be a great advantage if the planters could be induced, by an additional reward, to plant them after the uſual working hours; and permit me here to remark, that I am ſurprized labourers of all deſcriptions are not employed in this manner; a calculation of what they earn in an hour could eaſily be made, and paid accordingly. Amongſt other advantages (and not one of the leaſt), it would help to keep them from *private*

whiſkey-

whiſkey-houſes, which are near almoſt every gentleman's houſe in the county of Dublin.

Previous to ſowing clover amongſt corn, it would be very uſeful to harrow the ground, which would not only be of infinite uſe to the corn, but all ſeeds ſowed in earth freſh ſtirred will more certainly vegetate, and it alſo deſtroys young weeds, that are by this time above ground. One of the ſtrongeſt reaſons for not ſowing clover-ſeed, until the corn has attained ſome growth, is the ſhade the leaves afford the young clover. I imagine if, after harrowing the ground, a ſmall plough was introduced once up and down in each furrow between wheat ridges, and the looſe earth ſhovelled in *between* the wheat plants in the month of March, April, or May, it would be a very beneficial practice, and aſſiſt the tillering of the wheat very much. If a top-dreſſing could be procured, it would be a good time to apply it between the harrowing and ſhovelling.

Mr. Talbot of Leixlip has introduced a new method (at leaſt in Ireland) of planting potatoes. They are ſet four in a clump, and each clump four feet aſunder, to be landed by ſhovels ſeveral times during the ſummer. Mr. Talbot ſpeaks largely of the great produce, but until we know the *net profit*, let it be ever ſo great, no judgment can be formed of its value; it certainly muſt leave the ground in a very fine ſtate (in light ſoils much too looſe for wheat), and gives an opportunity to employ the women and children of a poor man hourly.

But

But of all the methods yet tried of planting this valuable root, that by the eyes ſcooped (but not ſo deep as generally practiſed), ſeems, from ſeveral trials made by many *unprejudiced perſons*, to deſerve the preference; and a ſtill ſtronger proof of this ſuperiority is the adoption of it by the labourers in their own gardens.

In the eſtimate for tilling an acre of ground, by a county of Dublin farmer, page 28, I imagine Mr. Archer has overlooked an error in the fourth year, "A Barley Crop." He has charged *1l. 7s. 6d.* for clover-ſeed, ſowing, and rolling; now as the courſe and the calculations on it end with the fourth year, it is not fair to charge it to that courſe, without at the ſame time giving credit for the produce, which, if equally good with his clover in the improved courſe, would be worth *17l. 3s. 10d.* clear of all expences; but, as it will be greatly inferior in produce and mode of conſumption, a very conſiderable reduction muſt be made, but ſtill ſomething muſt be allowed.

In the improved courſe, page 35, under the article "Fourth Year, Winter Crop, Rape," Mr. Archer ſays, "Dunging this crop is abſolutely neceſſary, and it may be well preſumed, that the preceding crops have afforded an ample ſupply of this article." As all the produce, except the rape, has been ſuppoſed to be ſent to market, and credit given for the receipt in the courſe, there remains nothing to make dung of, as without the ſtraw it is utterly impoſſible, that the ſtock

can

can have made in the proportion of 150 loads of dung for the acre of rape recommended at the concluſion of the courſe; if the dung had been drawn from Dublin, the 150 loads of dung would have been worth at leaſt 16*l.*; but as he has charged only three pence per load, it is evident home-made dung is here meant.

The ſtrong predilection of farmers for corn crops has chiefly ariſen from an ignorance of the value of green ones; but the influence of example muſt ultimately tend to change their ideas, for Iriſh farmers are not that race of mules that prejudice ſo often calls them; only *convince their judgment* that they ſhall not loſe, and I am perſuaded they will purſue very different methods from what they follow at preſent. How very juſtly might theſe very farmers retort on their landlords, that make it *a faſhion* of uſing this language, "Why do not you, who have plenty of money, and have an opportunity of ſeeing improvements, reclaim your bogs and mountains, or inform us in what manner theſe improvements are to be conducted? We cannot read, or leave our farms, and unleſs you ſend us a perſon to inſtruct us, how are we to learn?"

Uſe of Oxen.

I conceive nothing can be more erroneous, than mixing horſes and oxen in the ſame draft. Surely it muſt ſtrike every perſon, that a ſpirited quick-ſtepped horſe

horſe and a ſlow-paced bullock can never draw an equal ſhare; even oxen ſhould be matched as nearly as poſſible in the ſtep.

The general method of driving plough beaſts is a moſt cruel one. I have frequently examined plough-goads, that had a ſharp ſpike above an inch long at the end, for the purpoſe of teazing theſe poor patient creatures; and I have not a doubt, that if the ſkin of a weak or ſlow ox could be ſtripped off, it would be found like a riddle. The ignorant ploughman and his careleſs maſter look on with indifference, whilſt an ill-tempered young ruffian is indulging this infernal diſpoſition.

If farming ſocieties withheld premiums from ploughmen or farmers, that permitted this or any other cruelties to their beaſts, it would doubtleſs have a good effect. A whip would anſwer every good purpoſe, without doing any injury; for cattle, that are much goaded, at length grow callous. If a bundle of hay was left on each headland, and every time the plough came there the driver would pull a good handful, and give it to his cattle as they walked on, *poſſibly* it might have a much better effect, and not *quite ſo hard work*, as beating on the head, and punching his cattle with a *ten foot goad*. In general the proper harneſſing of all beaſts ſeems to be but little attended to; if the collar and ſtraddle are made ſo ſoft as not to hurt the horſe, and a great quantity of *white ſtitching on the leathers*, little

little attention is paid to the *line of draft*; yet a glance muſt convince any perſon, that *any angle in this* muſt add conſiderably to the preſſure on the horſe's back; this may be obſerved every day in three-horſe carts, where the middle horſe happens to be taller than the other two.

Nature and uſe of Implements of Huſbandry.

The Scotch plough has lately been very generally uſed; ignorance and prejudice ſay it will not do for this country; that it kills the horſes, &c. &c. &c. Thoſe who have given it a *fair trial* recommend it highly; but it is very probable it may have been often badly made, or improperly ſet. This averſion to any but the common implements of the country is a general complaint every where, and by no means confined to Ireland; one of the moſt pregnant proofs of this occurred at the Caſtleknock ploughing match two years ſince; the beam of the plough uſed at this exhibition was of very great length, the mould-board very long and very high. When the plough was entered in the ground, the ploughman threw himſelf almoſt on his left ſide, and by this means loaded this monſtrous mould-board with at leaſt four hundred weight of earth, which he carried to the other end of the ground, and with no little exertion threw it off, to enable him to turn; this, I was informed very gravely

by an old farmer, was to *keep the plough ſteady*; until this time I thought the poſture of a good ploughman was nearly upright, but here the farmers of the neighbourhood ſeemed to prize the man, that carried the greateſt weight of earth, and kept his left hand neareſt to the ground. As there was no plough of a better make produced at the meeting (to the ſhame of the neighbouring gentlemen be it ſpoken), there was no little exultation at their *unfortunate* ſuperiority. For the honour of my country, the remark made by a gentleman's Engliſh ſteward was not a little grating, "that this meeting did not ſeem to be intended for the promotion of good ploughing, but to make the bad worſe." On removing the earth after this wretched ploughing, the ribs of hard untouched earth might be eaſily diſcovered, which in a retentive ſoil muſt be very prejudicial to crops, as they prevented the water from running into the furrows.

Many farmers object ſtrongly to ploughing deep, for fear of turning up the bad earth. I conceive nothing can be more beneficial than turning up a *ſmall quantity* every year, if the ground has been looſened by *the miner* (which does not turn up any earth) the previous year; this looſens and *admits air* to the ſubſtratum, and renders it more fit for turning up the enſuing year; it alſo helps to remove the wet below the roots of fibrous plants, and, where tap-rooted plants are to be propagated, will be found highly uſeful, as it will,

will, if *ſteadily* and *judiciouſly* perſiſted in, give an opportunity of ſowing theſe crops in ſoils, that otherwiſe never would be fit for them; but if an ignorant enthuſiaſt was to turn up a great quantity of clay *at once*, as we ſee frequently done in gentlemens' gardens, the conſequence would be very bad. The miner* is an admirable inſtrument for preparing the ground for planting trees; it ſaves the expence of ſpade-trenching, which is an item in planting of no ſmall amount, very frequently more than all other expences. A ſtrong argument in favour of deep ploughing is the beneficial effects of gradual trenching in kitchen gardens, which, though frequently of no better quality than the adjoining ground cultivated by the plough, is rendered infinitely better. Deep trenching in kitchen gardens occaſions a great waſte of dung to counteract the pernicious effects of a large quantity of clay turned up *at one time*; this cauſes vegetables very often to have a rank taſte, which thoſe produced in freſh earth, moderately manured, never have.

* A plough-ſhare fixed in a ſtrong beam without mould-boards, and drawn by four horſes or oxen, and follows in the furrow the plough has juſt made, and, without turning up the ſubſtratum, penetrates into and looſens the ſoil from eight to twelve inches deeper than the plough had before gone; which operation, beſides draining the land, cauſes the water to carry along with it any vitriolic or other noxious matter; by the ſubſtratum thus looſened, the roots of plants may penetrate the deeper, and, in courſe of time, that which is but a barren ſubſtance may become fertile ſoil.—*Lancaſhire Survey*, *p.* 33.

Croſs ploughing is very much practiſed in this county; I cannot perceive any benefit in it: indeed, where ground has been ploughed in the Caſtleknock mode, it is very uſeful, as it chequers ſome of the hard ribs left by this *premium ploughing*, but it muſt be conſidered always as a tacit confeſſion of ſome *previous imperfection* in the ploughing.

Until lately, we could not boaſt much of any improvement in theſe matters; the drill-barrow is now generally uſed, and, from its extreme ſimplicity and uſefulneſs, is likely to obtain a place amongſt the implements of the pooreſt farmers, as they will ſoon ſave much more in ſeed than their original coſt. As a ſtrong proof, that greater attention has been lately paid to the proper conſtruction of the plough than formerly (tho' I am informed by a Scotch ploughman, far inferior to Small's plough), I have been informed by Meſſrs. Nugent and Orſon, that they have ſold at their manufactory in Henry-ſtreet, from the 24th of October 1800 to the 25th of March 1802, 119 ploughs, moſtly after the Scotch model; and from September 1801 to March 1802, 31 drill-barrows, chiefly their own improvement on a former model, and every other kind of improved implement in proportion.

As this is the amount of ſales at only one manufactory, what muſt be the number throughout all Ireland, excluſive of the great numbers imported into Dublin, the North, and other parts of Ireland from Scotland?

As

As men of fortune and ſcience have turned their thoughts to this very neceſſary branch of mechanics, doubtleſs we may expect that ſome data may be given, that will bring it to that certainty, which workmen in general cannot attain. Owen Wynne, Eſq. of Hazlewood, county of Sligo, obtained a premium from the Farming Society of Ireland, at Ballinaſloe, in October 1801, for his invention of a plough, that, I am informed, bids fair to accompliſh the wiſhes of agriculturiſts, and is therefore likely to be brought into general uſe. Many other gentlemen, I underſtand, are moſt laudably employed on this moſt uſeful ſubject. The very high prices, at which thoſe improved implements are ſold, are a very great obſtruction to their adoption by ſmall farmers; as few ploughs are ſold for leſs than ſix or ſeven guineas; poſſibly this may be as low as they could be ſold, according to the mode of making and finiſhing; but until ſome change takes place, either in the materials or conſtruction, that will bring them within the reach of ſmall farmers, they muſt fail of that general adoption, ſo deſirable in all improved implements of agriculture.

Uſe of green Food in Winter.

The ſoil of the greater part of this county is well adapted to the cultivation of cabbages, and Dublin market always prevents any remaining on hands; the culture

culture of them is ſo well known, it is needleſs to repeat it here; but I imagine it would be an improvement, if they were planted in the intervals of beans, in four-feet rows; they would be ſheltered from the ſun, and kept moiſt by the ſhade of the beans; by the time they wanted room the beans would be fit to pull, and, when carried off the ground, the cabbages might be landed with the plough. Early mazagan beans are the beſt for this purpoſe, as they are ripe a month before horſe-beans, and always ſell better; by this conſtant ſhading, ſtiff ſoils *in ſummer* will be (contrary to the opinion of fallowiſts) greatly ameliorated. If cabbage-plants are dipped as high as the firſt leaf into liquid cow-dung and lime, it will prevent the grub injuring them, and will alſo aſſiſt their taking root ſpeedily.

I am very much inclined to think, if beans were ſowed thick, and cut when beginning to bloſſom, they would be one of the moſt valuable vegetables we propagate, either as green food, or made into hay. Horſes and cattle are particularly fond of the withered ſtalks of beans, after they have been threſhed; then how much more palatable and nouriſhing would they be, if cut in this ſucculent ſtate, made into hay, and, as they are wanted in winter, cut by a ſtraw-cutter? I ſhould think, infinitely better than cut ſtraw of any kind. One great advantage of this crop is, that it may be ſowed from January to July, and will be an admirable *preparation for wheat*, much ſuperior to beans *ſaved for ſeed*,

ſeed, and, for an intermediate crop, certainly much ſuperior to buck wheat.

As many farmers are frequently prevented from ſowing turnips at the proper ſeaſon, it may be uſeful to them to be informed, that early ſtone and early Dutch turnips will anſwer for a late ſowing much better than any kind of ſheep turnip, as they not only come into uſe much ſooner, but they do not run ſo much *to tops*, are much more apt to apple, and equally hardy as any other ſort, except the Rutabaga or Swediſh turnip. The value of this moſt uſeful root ſeems to be but little known, and, where they have been tried, they have generally failed; this, I am convinced, is cauſed by ſowing them too late, which prevents their having any bulb; they ſeldom ſucceed, if ſown later than the beginning of May; and I am inclined to think, if they were ſowed in March, it would not be too ſoon, eſpecially if they are to be tranſplanted. I have had theſe roots very fine in a *ſtiff clay*, and, after ſaving the ſeed from them, they were eatable, which is a convincing proof, that they would be very valuable for ſheep or cattle, when other kinds of turnips were conſumed, or in a forward ſpring had run to ſeed.*

The

* William Jones, Eſq. of Liſtoke, near Drogheda, has experienced the uncommon value of the Swediſh turnip laſt winter (1801) in fattening cattle, which we may hope to have detailed in the County of Louth Survey, with many other ſpirited practices of this gentleman.

The practice of covering potatoes in the lazy-bed method with a great quantity of earth is very prejudicial; this may in some measure account for scanty crops; it proceeds generally from an opinion, that landing them is useful; so it undoubtedly is, but they do not discriminate between putting earth gradually between the stems, when they are *above ground*, and covering them deeply *before they come up*; one is landing, the other is smothering.

Planting the smallest and worst potatoes is a very general practice; this may also account for bad crops: if the largest and fairest *only* were always planted, I imagine, contrary to the opinion of many, they would never degenerate.

The Right Hon. David Latouche has this winter at Marly-stall fed a number of bullocks on borecole, cabbage, turnips, and finished them with steamed potatoes. For this purpose a boiler has been lately erected, which steams six or seven hundred weight at one time; the contrivance for washing saves a great deal of trouble, and the whole arrangement does great credit to his steward, Mr. Blackman. When Mr. Latouche's watered meadows are finished, he will be able to *feed in the house* winter and summer, by which an immense quantity of manure will be made for the part of the demesne, that cannot be watered. The plantations in this demesne are constantly mowed for soiling *in the house*; this makes a very great addition of food

for

for ſtock from ground that, in the uſual way of managing ſuch places, is totally unproductive; this, in a demeſne of great extent like Marly, is a matter of ſome moment, and deſerves more attention than it generally receives. Carrots for horſes are alſo uſed here, and have produced uncommonly good effects, inſomuch that they are likely to be introduced on a large ſcale; in ſhort this demeſne is likely to become the ſchool of improved huſbandry for the county of Dublin, as it has long been for ornamental planting.

CHAP. III.

SECT. I. *Paſture.*

NATURE OF IT.

THIS branch of rural œconomy is improving rapidly, and might ſtill be vaſtly improved, if farmers were more ſenſible of the value of limeſtone or other valuable gravels, which almoſt every farm in this county poſſeſſes. Every perſon is now become ſo ſenſible of the value of manure, that the price of dung is raiſed cent. per cent. higher than it was ten years ago, and the kitchen gardeners complain, that the farmers take all the dung from them; this is a moſt convincing proof, that rapid improvements are making in land. If ever the farmers become ſenſible of the great and laſting value of *watered meadows*, and of manure *made at home*, at leſs than half the expence of what they buy, the dung will again be had on reaſonable terms by the kitchen gardeners, which, with the uſe of the plough inſtead of the ſpade, will enable them to bring vegetables to market on better terms than they can at preſent.

Breaking

Breaking up paſture to prepare it for corn or potatoes, when the ſod is tough and graſſy, is very frequently a work of ſome difficulty, as we often ſee them drawn about the field into heaps without being divided into ſmall pieces; this, I preſume, could be very eaſily prevented, by harrowing the ground acroſs *previous* to the ploughing; for this purpoſe the harrow ought to be ſo heavy as to ſink into the ſod two or three inches; the teeth ſhould be very ſharp, and made without any bend, as they are only to ſcore the ſod; this, if judiciouſly performed, will ſave much time and expence: the inſtrument called a ſcarificator, with coulters *only*, is well adapted for this purpoſe, but the harrow will anſwer where this implement is not to be had. Harrowing graſs-lands in ſpring will be found a moſt beneficial practice, as it helps to deſtroy moſs, and cauſes a fermentation highly ſerviceable.

The paſture of the Phœnix Park forms a moſt diſagreeable contraſt to the ground around it in every direction. I am at a loſs to account for the neglect of this charming place; if it was properly drained, that alone would change the appearance and the nature of the herbage, and the produce would be infinitely better and more abundant. Some attempts were formerly made to drain it, but indeed moſt wretched ones. I hope this hint will be noticed by thoſe, in whoſe department ſuch affairs are.

There ſeems in general to be a very great careleſsneſs in laying down gentlemens' lawns; a very little additional expence and ſome attention would in general accompliſh it, as nature ſeldom wants more than a little aſſiſtance.

If children were employed in paſture ground to collect dung and weeds, it would have a good tendency; they might have ſmall baſkets, and collect it in ſmall heaps, to be paid *according to the quantity they collected*, and not by the day; it would help to make them induſtrious and emulous, and it would alſo make a very large addition to the dunghill, of a manure, that is of little uſe to the paſture in ſummer; and the weeds, if gathered *before they ſeed*, might alſo be turned into manure in the *urinarium*, which no farm ſhould be without.

There might be a vaſt addition to the paſture and meadow of this county, if the proprietors of the Dublin mountains could be induced to improve them; were they ſenſible with what eaſe bog and moory ground may be reclaimed, we might hope to ſee thoſe dreary waſtes in view of Dublin highly improved and thickly inhabited.

Counſellor Caldbeck has on theſe mountains made a beginning; Mr. Foot too, I am informed, is about to plant a large tract of the ſame mountain, which is fit for nothing elſe. Mr. White has alſo lately purchaſed a very valuable part of Hutchinſon's Charity, which,

if

if improved with judgment and ſpirit, will be more valuable than probably he is aware of, as irrigation, the cheapeſt, moſt rapid, and moſt permanent improvement, I am informed, can be carried into execution at a very moderate expence. This mode of improvement ſeems to be totally unknown to Mr. Foot, who poſſeſſes an uncommon fine ſituation for the purpoſe, with great command of water.

Nothing can be more injurious to the proprietors of bogs and mountains, than the general mode of ſetting them. The uſual method is to ſet perhaps twenty, fifty, or more acres of arable or meadow, and throw into the bargain the ſide of a mountain of perhaps many hundred acres, as of no ſort of value, and which the tenant neither knows how nor has the means to improve; theſe hills are generally ſtripped for ſcraws for burning, or covering their cabins, which deteriorates the land for ever, and is a moſt wretched firing. I recollect once to have aſked a gentleman, why he ſet his land in this manner; "Why *my agent* tells me they are worth nothing, that they are totally irreclaimable." Yet at the ſame time ſtreams of water were pouring down the ſides in every direction, and for, I dare ſay, from three to five guineas per acre, it might be made to produce an *annual rent* of from one to five pounds an acre, as it was in the neighbourhood of a large town. I hope I will be pardoned when I aſſert, that nothing has hurt the landed property of Ireland ſo much as the

the management of eſtates being committed to thoſe, who are totally unacquainted with rural affairs; and, until an *agricultural agent* is appointed to great eſtates, they muſt ſuffer great loſſes, as drawing leaſes, and being able to give advice in law affairs, though abſolutely neceſſary, are very different from reclaiming waſte lands, or pointing out the capabilities of eſtates. I am poſitive the rent-rolls of many eſtates in this country might, by a little exertion, be nearly doubled, and, at the ſame time, the condition of the tenantry ameliorated. It is a melancholy reflection, that there are many eſtates, that have from *twenty to ninety thouſand acres* of waſte land, the greater part of which might be made to produce *at leaſt* 20 per cent. for the money expended on their improvement.

SECT. 2. *Breed of Cattle—how far improved.*

THE improved breed of ſheep have lately been objected to on account of their exceeding fatneſs; it is ſaid, that ſuch over-fat mutton is profitable only to the chandler. It is proper they ſhould be informed, that this great propenſity to fatten is one of the chief perfections of all animals deſtined for the uſe of mankind. The Leiceſter ſheep are as fit for the butcher at two years old, as the other breeds are at four; from this conſideration, and their producing much leſs *offal* than the

the old breeds, they are more valuable for both feeder and conſumer. Few people, I imagine, would wiſh to eat mutton as fat as what has been generally produced *for ſhew*; but this is eaſily prevented by ſtocking the ground harder, or killing or ſelling when at the wiſhed for point of fatneſs, and ſtocking the ground again with others. Mr. Grierſon has procured ſome of the South Down ſheep, which are admirably adapted to our higher grounds.

Nothing can prove more ſtrongly the ſuperiority of the improved breeds of both cattle and ſheep, than the avidity with which rams and bulls are hired by men, who live by the breeding of cattle; were theſe ſought after only by men of fortune, we might perhaps be led to think there might be a good deal of *faſhion in it*; but when we ſee profeſſional men engage with ſpirit in it, we muſt conclude they are influenced by more *weighty* reaſons.

SECT. 3. *Breed of Cattle—how far capable of further improvement.*

IT would be great preſumption to offer any thing deciſive from myſelf on this head, as the breeders are by no means determined amongſt themſelves to which breed to give the preference; but I preſume the very different purpoſes, for which the cattle are deſtined, muſt

muſt be always conſidered, as it ſeems to be the opinion of Mr. Culley, and other ſkilful breeders, that the two moſt eſſential qualities, a propenſity to fatten, and the giving a large quantity of milk, are very rarely to be found in the ſame beaſt.

As the richneſs of milk is a very deſirable quality, and it is very generally agreed that ſome breeds, or individuals of breeds, poſſeſs this quality in a very eminent degree, it is incumbent on us to pay a great attention to this circumſtance; but in general cows, that give the greateſt quantity, are more ſought after than thoſe which, though they give leſs milk, make ample amends in the richneſs of its quality. Our native Kerry breed are generally allowed to poſſeſs theſe two qualities, conſidering their ſize, in a very ſuperior degree; and I have little doubt, if this breed was improved by *an unprejudiced ſcientific breeder* for a few years, they would be brought to a very high degree of perfection; and Mr. Culley ſeems to think the Galloway and Kyloe breeds, to which laſt kind I underſtand our Kerry are nearly allied, are very valuable.

As an inducement to purſue the hint *I have ventured* to give, and to ſhew what may be done by judicious ſelection and perſeverance, it may be neceſſary to remark, that the general character given by Mr. Culley of the Leiceſter cattle, before the late Mr. Bakewell had the ſpirit and judgment to improve them, was very unfavourable to the attempt; he ſays, page 53, "they

are

are diſtinguiſhed from others by the length of their horns, the thickneſs and firm texture of their hides, the length and cloſeneſs of their hair, the large ſize of their hoof, and *coarſe, leathery, thick necks*; they likewiſe are deeper made in their fore-quarters, and lighter in their hind-quarters than the other breeds in general; they are narrower in their ſhape, and leſs in point of weight, than the ſhort-horns:" and in another place, "this breed is underſtood by graziers to be in general rather *ſlow feeders*." It is needleſs almoſt to mention what the improved breeds are—the very reverſe of what they were.

The improvement of the breed of ſheep has engaged the attention of men of fortune and liberal ideas, conſequently a rapid improvement muſt very naturally be expected. I am not ſufficiently acquainted with the ſubject, to offer any hints for their improvement; but I preſume there cannot be a ſtronger proof, that breeders view this ſubject with a moſt diſcriminating eye, than the importation of the South Down by Mr. Grierſon, and the intention of importing the Cheviot breed by other ſpirited gentlemen, for the purpoſe of ſtocking elevated ſituations, where it is imagined they will ſucceed better than the other valuable breeds.

Nothing can more ſtrongly evince the rapid improvement in the breed of cattle and ſheep, and, at the ſame time, the ſpirit and diſcernment of the breeders of Ireland, than the ſhew of fat cattle and ſheep, held before

the Farming Society of Ireland, at Leinſter-houſe, on the 8th of April 1802. The numerous attendance of men of fortune, and of the moſt eminent graziers from all parts of Ireland, and ſome from England, proves moſt unequivocally, that they view it in the light intended by the Society, when they offered premiums for the propagation of a breed, that would give more profit to the grazier, the butcher, and the conſumer. It is very generally allowed, that handſome fine-boned cattle and ſheep require leſs food to rear, or to make them fat, than large-boned coarſe ones, and that they are fit for ſale at an earlier age than the old breeds, which makes them more profitable for the grazier. The beef or mutton is finer in the grain, and better marbled; and, as the improved breeds put the meat moſt on the parts that ſell higheſt, they are conſequently moſt advantageous to the butcher. To the conſumer it is evidently moſt profitable, becauſe he has to pay for leſs bone in proportion to the weight of the piece.

The reſult of this ſhew tends to ſtrengthen the opinion of the moſt enlightened, conſequently the moſt unprejudiced breeders, that *beauty of ſhape* generally accompanies a propenſity to fatten; for Mr. Martley's cow, that gained the premium laſt November for having leaſt offal, was very fine in her ſhape; and Mr. Reynell's cow, that gained the premium, for having leaſt offal, at the preſent ſhew, was exceedingly handſome. Though the day was very unfavourable for the exhibition,

exhibition, ſo warmly intereſted were men of the higheſt rank, they ſeemed to defy the inclemency of the ſkies. His Excellency the Earl of Hardwicke, actuated by thoſe feelings, which have unceaſingly directed him to the promotion of every object connected with the proſperity of Ireland, ſeemed regardleſs of every thing but the gratification of the moſt laudable and moſt minute enquiry, and, in his remarks, evinced that ſome motive more noble than mere curioſity occaſioned the welcome viſit; and, in his inſpection of the cattle and ſheep the ſecond day, when ſlaughtered, his queſtions and obſervations ſhewed a deſire to obtain correct information on this intereſting ſubject, and helps to prove moſt ſtrongly the rapid advances any ſcience muſt make, when men of exalted ſituation undertake this moſt uſeful, and, I am ſure, this moſt pleaſing taſk.

The fat cattle produced at this ſhew greatly exceeded, in number and fatneſs, thoſe at any former exhibition; and as, by this means, the ineſtimable value of green winter food is now fully eſtabliſhed, we may expect the next ſhew will even exceed this, as numbers are preparing for the purpoſe.

By a miſtake in claſſing below his weight, a fine ox belonging to the Right Hon. David Latouche was debarred his chance of a prize, which, from his extreme fatneſs and ſmall bone, there was every reaſon to expect he would have obtained; his fat was exceedingly yellow, which was objected to by many; but I am

informed the fat of the Guernſey beef (the fineſt flavoured in the world) is a very high yellow; the great fatneſs of this ox is a ſtrong proof of the nouriſhing quality of ſteamed potatoes, with which I am informed he was fattened.

Many beaſts, though very fine, did not ſtand a competition; for they muſt be of no ordinary degree of excellence indeed, that could obtain a prize amongſt ſuch numbers of fine cattle; but the good humour, with which candidates received a rejection or information of loſing a prize, evinced in the happieſt manner the liberal ideas, that are now entertained by every claſs of men, and at the ſame time proved moſt unequivocally the deſervedly high ſenſe, that was entertained of the candour and impartiality of the judges appointed for the occaſion, and that they were not influenced by the pre-judgment of others, which, as in all ſuch caſes, was pretty freely given.

The ſhew-ground, given for the occaſion by his Grace the Duke of Leinſter, with equal public ſpirit and polite attention to the accommodation of the Farming Society, though much more capacious and commodious than could be obtained elſewhere, was by no means large enough for the purpoſe, and failed in ſome degree of that ſtriking effect, which more room to arrange the cattle would have produced; but there will be this advantage attending the inconvenience, that the Society will have an opportunity of forming a

better

better opinion of the ſpace of ground, that will be requiſite for the erection of a permanent place of exhibition, than they otherwiſe might have had; and they certainly ſhould look forward to an eſtabliſhment, that will not only comprehend the different claſſes of fat cattle, ſheep, and pigs, but alſo the eaſy accommodation of all the different kinds of breeding ſtock, that public ſpirit, emulation, or intereſt will doubtleſs pour in from all parts of Ireland, and moſt probably from England. They will likewiſe want ample accommodation for a *permanent ſtock* of their own, of the moſt ſelect of all the different breeds of every ſpecies uſeful to mankind, by which means the inexperienced will have a daily opportunity of making their *eye and hand* familiar with the perfections and defects of each breed, which muſt ultimately tend to eſtabliſh ſome unerring data, that may in future be relied on; for at preſent, though great advances are made by ſome enlightened individuals, the predilection *for bone*, which is ſtill very ſtrong in the minds of ſome extenſive graziers, can only be removed by frequent repetitions of the ſhews, whereas, if the prizes continue to be uniformly gained by beaſts of fine bone, we may expect conviction will be followed by a dereliction of their former prejudices.

Some very fine pigs of improved breeds were produced, particularly a ſmall Iriſh one of a very perfect ſhape; alſo a very large ſow was produced, but the owner

owner did not ſeem to be aware, that ſize alone does not conſtitute perfection.

From the precautions taken by the Society, not the leaſt accident happened; and every attention and accommodation was provided, that the nature of the buſineſs would admit; it muſt have been highly gratifying to the Farming Society to obſerve pleaſure expreſſed on every countenance.

Though the Dublin Society have mentioned only cattle in their ſuggeſtions for enquiry, I preſume they do not wiſh the Surveys to be ſo limited, as to preclude any obſervations, that may tend to improve any other kind of uſeful ſtock. The breed of horſes has been rapidly improving for ſome years paſt; but many of our breeders, I preſume, like the breeders of cattle and ſheep of the old ſchool, think that a great encreaſe of ſize conſtitutes the chief perfection; but I believe it will be found, that horſes do not poſſeſs ſtrength in proportion to their ſize; if this was the caſe, mules would be very weak, which, every one knows, draw much more in proportion to their ſize than the largeſt dray horſe; and not one of the leaſt injurious conſequences of this predilection for ſize is the near affinity it has to the prejudice in favour of very large waggons, in preference to light carts; if the truſtees of roads or the commiſſioners of paving were aware of the ruinous conſequences attending the admiſſion of theſe unwieldy machines on roads or pave-

ments,

ments; they would lay a tax on them amounting to a prohibition; beſides, the exertions of theſe great horſes, armed with cocks to their ſhoes, very often two inches long, muſt break up the moſt firm road.

I imagine the Cleveland bays, mentioned in ſuch high terms by Mr. Culley, would be a much more deſirable kind of horſe to introduce into this country, than either the Suffolk Punch or unwieldy dray horſe, as they poſſeſs equal ſtrength, and more activity; and, if a little pains is taken in ſelecting the mares, a great probability ariſes of obtaining very fine hunters or carriage horſes; but from the Suffolk Punch nothing can be obtained but a ſerviceable ugly drudge, and I am convinced we poſſeſs many of that deſcription already; if quickneſs of ſtep, ſo neceſſary in ſeed ſowing and for other purpoſes, is wanted, the Cleveland bays I preſume deſerve attention, as well as for their colour.

Markets or Fairs for them.

SMITHFIELD market is much too confined, and by no means adequate to the buſineſs tranſacted there, and which is likely to encreaſe. I beg leave to ſuggeſt the neceſſity of opening it up to Brunſwick-ſtreet at one end, and down towards the river Liffey, as far as a ſtable-lane in Weſt Arran-ſtreet, at the other end; this could be eaſily accompliſhed, as the houſes are of ſmall value.

On

On many market days there is ſcarcely room to paſs, and hay-cars are frequently obliged to ſtand in the adjacent ſtreets, liable to the depredations of pilferers of every deſcription. The ſtate of this market is always very filthy, and, as a day intervenes between each market, there is no excuſe for it; thoſe who want hay or ſtraw are frequently obliged in wet weather to ride through it.

The preſent mode of keeping cattle at random, cloſe to the houſes, is a very great nuiſance; were they ranged with their heads towards the ſheep, leaving a broad paſſage between them, they could be more eaſily and ſafely handled and viewed, and a much leſs ſpace of ground would anſwer; at preſent they are only kept in order by the ſticks of the penny-boys; and I am ſorry to ſay, that the abuſes cattle and ſheep ſuſtain from theſe ruffians do little credit to the humanity of the ſales-maſters, who are the only perſons, that can redreſs this grievance, ſimply, by refuſing to deliver any beaſt to one poſſeſſed of a *ſtick*.

Donnybrook fair has been long complained of as a nuiſance, and a moſt dangerous one it is; as the recruiting ſervice is at an end, that excuſe can no longer be uſed. The ſcenes of riot and drunkenneſs, that take place, are moſt diſguſting, and can ſurely anſwer no purpoſe, but to put money in the pockets of publicans, at the expence of the morals and health of the people. I ſincerely hope to ſee it aboliſhed before the

next

next meeting, and a compenſation made to the proprietor of the tolls, which could be eaſily adjuſted.

Mode of Feeding, and how far houſed in Winter.

One of the greateſt inconveniencies attending the want of green winter food for cattle is, the neceſſity graziers are under frequently to ſell them, whether fat or lean, before or about Chriſtmas, from want of feeding. This is alſo a public loſs, as about that ſeaſon a glutted market pulls down the price often below the value; for if theſe cattle (ſuch as are lean) were provided with green food in winter and ſpring, it would help to keep the market ſteady, and cattle would not only increaſe in ſize, but vaſt numbers would be reared, that are now killed when calves, from a deficiency of green winter food. This mode of feeding would alſo give a great increaſe to the dairies, which are declining very much, as, where they are diſtant from diſtilleries, hay alone produces but little milk. I have heard many farmers complain, that their cows gave little milk, though they were poſſeſſed of great quantities of ſmall potatoes; on adviſing the uſe of theſe, I have more than once been told, *boiling was very troubleſome:* then give them raw; they will choak them. I am ſurpriſed ſuch people ever propagated them, as the planting, digging up, &c. &c. are *nearly*

as troubleſome as waſhing and boiling a pot of potatoes, or cutting a few raw ones.

All thoſe, who have houſed cattle through the year, have borne teſtimony to the uncommon benefit of the practice. One very great advantage attending the houſing ſyſtem is, that fences (except a ring one) are no longer neceſſary; no unnatural clipped hedges—no taſteleſs white paling—no expenſive ſunk fence—no waſte of food—*no waſte of ground*, &c. &c. This laſt item, where ground bears a high rent, is a very material article, as, on examining maps, the ditches make a very large ſhare, eſpecially as incloſures here are generally ſmall.

It will be always a moſt happy circumſtance in laying out improvements, as the expence and difficulty of fencing often marrs the moſt elegant deſigns, as clumps or ſingle trees, whilſt young, are with great difficulty protected from cattle. How happy muſt be the man then, that can plant as taſte, not as convenience dictates?

Doubtleſs it is only want of reſolution, that prevents many from practiſing this method of feeding; but if they only *begin on a ſmall ſcale*, they will be agreeably ſurpriſed at the *great* comforts of this method. Let me aſk any of thoſe agricultural ſceptics who have working beaſts, would they not thrive better by having a belly-full of nouriſhing food, and then lie down to reſt themſelves, than perhaps *walk about for it* the greater part

part of the night in a bare paſture, or breaking into their neighbours or their own meadows or corn.

Beaſts that are not working, and young cattle, ſhould have a ſmall dry incloſure to air themſelves in for about an hour every day, whilſt their ſtalls are cleaning.

Permit me to remark here, that the *mountain of manure* raiſed at Marly by this method of feeding, in two months only, will ſpeak forcibly in its favour, and in a *language*, which every farmer underſtands.

Sect. 7. *Natural Graſſes.*

With very little care our natural graſſes would be moſt excellent, as we in general poſſeſs all the beſt ſorts; but ſcarcely any attention is paid to the time of their foliation, which is a very neceſſary, but neglected ſtudy of farmers. It cannot be ſuppoſed that, whilſt ſome are in ſeed, and others are only juſt beginning to vegetate, either the hay or paſture can be good; for, if made into hay, the farmer frequently waits until the late kinds are fit to cut; if theſe predominate, the early kinds muſt *then* be not near ſo good as ſtraw; on the contrary, if early ſorts are the moſt numerous, the late kinds are cut at a period when they either fall through the teeth of the rake, or ſhrink into almoſt nothing when dry.

The Dublin Society, and many other agricultural ſocieties, have very laudably endeavoured to direct the attention of farmers to this ſubject, by pointing out the kinds of graſſes moſt proper to be ſown together, and offering premiums for ſaving the ſeed of each kind diſtinct; this, if ſeconded by landholders, will in a ſhort time be of infinite ſervice. It has been objected to this, and to the cultivation of artificial graſſes, that our ſoil is in general ſo much inclined to produce an infinite variety of graſſes, and ſome of them very bad ſorts, the ſelected kinds would ſoon be overpowered and deſtroyed. If a little attention is paid for a year or two, and the ground *completely* occupied with the ſelected ſorts, ſcarcely any other will have room to grow; a few may undoubtedly eſcape the attention of the moſt diligent, but this can be but a matter of ſmall moment. I ſuppoſe to this I ſhall hear the ſame objection, that I have been eternally bored with, when I have propoſed any thing out of the old mode, "It is too troubleſome."

One of the great advantages of irrigation is the production of the beſt kinds of graſſes, or, at leaſt, the amelioration of the quality of inferior ſorts.

When the great benefit of lime, limeſtone-gravel, or marle are better known, we may expect the beſt kinds of graſſes will become more prevalent, as it is well eſtabliſhed, that all calcareous manures diſpoſe the ſoil to produce this effect.

From

From the invitation of the Dublin Society to farmers to view their gardens at Glaſſnevin, one would have naturally expected, that on every market day, or at leaſt on Sundays, we ſhould have ſeen them in crouds examining the hay and cattle gardens; learning which plants to propagate, which to extirpate, what kinds *preſerved the leaf in winter*, or were food for cattle *very early in ſpring*, &c. &c. On enquiry I found, that men of this deſcription ſcarcely ever appeared at the Botanic Garden; perhaps many, that would avail themſelves of this permiſſion, do not know any thing of it. Poſſibly a board put up on the gates with, "Farmers are admitted to ſee theſe Gardens every day, between the hours of ————————;" or, "Farmers are invited to ſee all the moſt valuable ſorts of graſſes, and other plants moſt uſeful to them, of which ſeeds, with the beſt mode of cultivation, will be delivered to them gratis; hours of admittance, &c." would contribute to the promoting of the laudable views of the Society.

Many adviſe the ſowing of graſs-ſeeds alone; this I muſt conſider a very bad practice, as not only a valuable crop of corn is loſt, but, if the ground is not uncommonly clean, great quantities of weeds will get the ſtart of the graſs-ſeeds and overpower them; and, if a continuance of dry weather ſhould happen after they are ſowed, very few will vegetate for want of *the ſhade* of the young corn, which ſhould not be ſowed quite ſo thick as if ſowed alone. I am ſo convinced of the great uſe of this practice that, were I to ſow graſs-

ſeeds

ſeeds in June or July, I would ſow a thin crop of oats, which ſhould be mowed *green* for ſoiling, and two mowings may be expected. This I have ſeen practiſed at Sir Thomas Lighton's, at Merville, near Dublin, in a very dry ſummer, with great ſucceſs.

As barley is generally ſowed in ground in good tilth, graſs-ſeeds are uſually ſowed with it; and, as it is ſooner ripe than moſt kinds of grain, it is the moſt proper; flax alſo, for the ſame reaſon, is very proper for this purpoſe.

There is no error citizen farmers are more apt to fall into, than over-cropping their ground; as they always pay very high rents, and, in the *beginning*, are very ſpirited farmers, they imagine they cannot have too many crops to help to repay them. The uſual mode is to break up as much as they can procure dung for, and plant potatoes. Apple potatoes are generally moſt planted; they are not fit to dig perhaps until November. Wet weather comes on, and they cannot ſow their wheat (for it ſeems nothing but wheat will do) until December or January. Rooks and all ſpecies of birds at this ſeaſon devour great quantities; the red-worm then attacks it, with a train of other misfortunes incident to late ſowing. Next ſeaſon, inſtead of breaking up the ſtubble the moment the wheat is carried off, it is permitted to lie (perhaps the furrows full of water) until March, and then *ſcratched* (not ploughed), and ſowed with oats. The third year wheat again;

again; the fourth year oats again; and in this impoverished dirty ſtate it is laid down with the ſweepings of the hay-loft *uncleaned*, conſiſting of every kind of rubbiſh. All this ſevere cropping is on the ſtrength of the dung the potatoes got the firſt year. Very frequently inſtead of laying it down, the fifth year horſes and cars are again ſet to work to draw dung from Dublin, at an expence of *at leaſt* twenty guineas per acre: probably by this time he begins to complain to his friends, that "there is little to be made by farming." Inſtead of this barbarous courſe, if the firſt year *early potatoes* had been planted, they would be off time enough for a crop of rape, which ſhould have been ſowed the previous June; theſe would be fine feeding until April, at which time *early* potatoes in drills ſhould be planted, to be ſucceeded by rape, as before, for winter feeding, and in March or April barley or oats ſowed with *clean hay-ſeeds*.

This, I am ſatisfied, would be a much better mode, and would leave the ground in the fineſt condition, and, contrary to the general wiſh of farming citizens, they would have *little to ſend to market*, which is a place they ought carefully to avoid. At the end of the ſixth year they would find the balance of the account greatly in favour of the laſt method, beſides the land being left in the moſt fertile ſtate. In this account a large ſum muſt be placed to the wear and tear of horſes and cars, and the endleſs torment of collecting manure,

manure, and *endeavouring* to counteract the numberleſs frauds, that will be practiſed on them in every thing they either ſell or buy; above all things they ſhould have *as little to do with Dublin as poſſible.* Probably this may not accord with the feelings of ſome, and may be thought to glance at citizens keeping country houſes; by no means; I do not know any deſcription of men, that deſerve the enjoyments of the country more. I only wiſh to point out the danger of citizens, of moderate and *uncertain* income, commencing farmers, with no more knowledge of the buſineſs than a farmer has of printing books, or giving a legal opinion. What would we think of a farmer that took a ſhop in Dame-ſtreet, and commenced haberdaſher? and yet, with due deference, it requires infinitely more abilities to be a good farmer, than to meaſure ribbands and tape.

Rye-graſs continues to be ſowed yet in ſome places, but appears to be, notwithſtanding all the encomiums, that have been paſſed on it, a very worthleſs kind in many ſituations. There has been a new kind of this graſs introduced lately by Mr. Peacy of Northumberland, which poſſeſſes ſome ſuperior advantages, which we are not as yet ſufficiently acquainted with to point out; for we ought not to form a general concluſion from a few trials in ſoils, that have received an uncommon preparation *for this purpoſe*, which is generally the caſe with any new kinds of plants, and always tends to miſlead us, and hurts the cauſe it was intended to ſerve.

SECT.

SECT. 8. *Artificial Graſſes.*

MR. ARCHER ſays, vetches are frequently half-threſhed, and given to horſes inſtead of hay and oats, and ſeems to think it an "excellent practice." I have frequently ſeen this practiſed, and the horſes were in fine condition no doubt; but *at what expence*, the farmer could not aſcertain. It muſt be a very uncertain way of uſing any crop, as it is not eaſy to know what quantity of grain is left in the ſtraw; that depending very much on the ſtate of the crop when reaped, or on the pleaſure of the threſher. Horſes may be made very fat by giving them as much ſheaf oats as they chooſe to eat; yet few farmers, I fancy, will be inclined to purſue this mode of feeding. There is nothing farmers are more remiſs in, than keeping farming accounts; it is more than probable thoſe, that uſe vetches in this looſe manner, do not know whether they have a profit of ten ſhillings or five pounds an acre. It is probable, if vetches, made into hay, were cut by a ſtraw-cutter, they would be uſed with more œconomy.

It is not a little extraordinary, that the diſtinction between ſpring and winter vetches has not as yet (that I could hear) been clearly aſcertained.

It has been aſſerted, that ſpring vetches do not ſtand the winter, if ſowed in autumn; and that winter

vetches, ſowed in ſpring, do not generally ripen their ſeeds. As ſome corroboration of the firſt aſſertion, I am informed Mr. Hamilton, of Larkfield, near Palmerſtown, has loſt four acres of ſpring vetches, ſowed in September laſt; and in contradiction to it, they have ſtood this ſevere winter in many places extremely well. If there is not ſome miſnomer in this caſe (the diſtinction not being known in the ſeed-ſhops), the opinion of their tenderneſs falls to the ground; until this point is ſatisfactorily cleared up, no opinion can be formed. Some time ſince, ſamples from Mr. Grainger, near Navan, in the county of Meath, were produced at a meeting of the Farming Society of Ireland, which he ſays were ſpring and winter vetches; one appeared to be much ſmoother and paler in the leaf than the other, and I underſtand the ſame diſtinction takes place in the ſeed. But as this gentleman is with great ſpirit trying experiments very largely (on twenty-ſeven acres), which we may hope to have detailed in the ſixth number of the Iriſh Agricultural Magazine, ſomething deciſive may be expected; he has ſowed them in ſucceſſion from Auguſt to November, and they have all ſtood the late froſts.

There are two kinds of indigenous perennial vetches, that ſeem to deſerve *great notice*; one is the buſh vetch (vicia ſepium); the other the wood vetch (vicia ſylvatica). They produce at leaſt as much as any of the annual kinds, are uncommonly hardy, and are equally good for

for either ſoiling or hay; as they are, in common with the annual ſorts, furniſhed at the ſame time with ripe ſeeds, flowers, and a profuſion of the fineſt herbage, which muſt, I imagine, make them particularly eligible for hay.

The propagation of vetches has encreaſed greatly theſe two years; and, when their value is better known, they muſt ſtill encreaſe more rapidly.

It appears to me there is a very great error in the general mode of uſing clover, or any other crop that is to be cut *more than once* for ſoiling; it is the uſual practice to begin to cut when the plants are *in flower*, conſequently, by not beginning to cut at an earlier period, ſome muſt become at length too old, and of ſmall value. It is the opinion of the moſt enlightened agriculturiſts, that clover, and moſt kinds for ſoiling ſhould be cut as ſoon as the ſcythe can catch them, which I would recommend, even if the firſt cutting was thrown on the dunghill; otherwiſe there cannot be a daily ſucceſſion of *young growth*. It muſt be evident, that it would be a waſteful practice with vetches, if they were cut ſo very early; but I muſt ſtill think that they are, in general, cut at too late a period. I am aware that vetches, and many other plants, are commonly eſteemed a ſtronger food, and to have more ſubſtance, when uſed in a more forward ſtate than I adviſe; perhaps they may encreaſe muſcular ſtrength, but it is probable they are not *ſo fattening*. As Mr. Grainger's ſtock is very large, and

he ſows *in ſucceſſion*, it is probable he never has them too old.

Oats and rye are in ſome places ſowed with vetches, both for ſupporting their trailing ſtalks, and to add to the quantity of ſoiling or hay; but I am convinced beans would anſwer the purpoſe much better.

Probably oats for ſoiling, or hay, will be found on trial a very valuable grain. An inſtance of their great value occurred laſt ſeaſon (1801), at Mr. Cave's, at Raheny, near Dublin. A very uncommon crop of oats, after potatoes, had been reaped the previous year, and a great quantity had ſhed, which grew ſo very luxuriantly the following ſpring, that Mr. Cave was induced to let ſome of the cleaneſt part ſtand for ſeed; the other part, which had ſome weeds in it, was partly mowed green, and given to cows and horſes *in the houſe*; the remainder I adviſed to be mowed for hay, which was given to horſes in the ſtable, without any oats; I never ſaw horſes in finer condition, or ſmoother in their coats. This helps to confirm me in an opinion I have long entertained, that oats mowed green would make an excellent hay.

When to the ſuperior ſtate of the ground, after oats *cut green*, is added the opportunity it gives of ſowing turnips, planting rape, cabbages, or borecole, or even as a preparation for wheat, I earneſtly hope it will at leaſt be thought to deſerve *an experiment*.

Timothy-

Timothy-graſs (phleum pratenſe) ſeems to have fallen into great neglect, though once a great favourite. Perhaps it was ſowed in improper ſoils; but on reclaimed bog it will probably be found a very valuable kind. It is a very early and hardy graſs; two qualities, which ſhould never be overlooked.

Sainfoin ſeems to be alſo little noticed; in England it has continued, in dry gravelly ſoils, to produce uncommon crops. We certainly have a great quantity of ground, that ſeems well adapted to its growth; ground that at preſent ſcarcely returns the ſeed. The very general opinion of Iriſh farmers (and Engliſh too), that few crops are profitable but corn, has done more injury than is generally imagined; but as we begin to be ſenſible of the ineſtimable value of *green winter food*, and *ſoiling in the houſe in ſummer*, better ideas may be expected to take place.

Lucerne has engaged the attention of agriculturiſts very much in England, but ſeems to have declined greatly in Ireland. When the ſoil is ſuitable (a deep, light, rich one), it is a plant of ineſtimable value. The beſt mode of ſowing it ſeems not yet to be clearly aſcertained; ſome authors adviſing it to be ſowed in rows three feet, and other intermediate diſtances aſunder, whilſt others contend for broad-caſt ſowing; of this laſt opinion I profeſs myſelf. It has been objected to this mode, that it is difficult to clean; this has ariſen, in a great meaſure, from ſowing too ſmall a quantity of ſeed;

ſeed; for in this, as in clover, and every other plant, if the ground is not covered *with them*, weeds will occupy the vacant places, as every perſon muſt have obſerved in clover fields; for where the clover has grown thick, not a weed is to be ſeen; on the contrary, where the clover has failed, the ground is uſually covered with weeds. Another reaſon for want of ſucceſs, is either ſowing them in dirty ground, or not *previouſly* harrowing the corn, amongſt which I would adviſe them to be ſowed. Where previous harrowing for this or clover is neglected, the young weeds get the ſtart of them and overpower them; the harrowing deſtroys the young weeds, and at the ſame time makes ſhallow drills for the ſeed in *freſh-ſtirred* earth, which, added to the ſhade of the young corn, cauſes them to vegetate rapidly, and be ſoon out of danger from annual weeds. Rolling after ſowing, *if the ground is dry*, is one of the moſt neceſſary operations, that can be performed. I am firmly perſuaded, more ſpring crops miſcarry by neglecting this ſimple operation, than from all other cauſes put together. Permit me to give an inſtance, that came under my own eye. In the month of Auguſt I ſowed a large border with cauliflower-ſeed in the uſual manner; after watering it frequently, I found very few, if any made their appearance, ſo I gave them up: ſome perſon came over the wall, under which they had been ſowed, and made ſeveral marks with his feet in his paſſage; in a few days more I perceived

perceived that, where the print of the feet was left, the cauliflower-ſeeds came up rather too thick: it remained in this ſtate *until October*, and not a plant grew in any other part of the border. The neceſſity of this operation is well known to all kitchen gardeners, and deſerves to be made known to farmers.

That lucerne and ſainfoin will maintain their ſuperiority, may be frequently ſeen in meadows where they have been accidentally ſowed: as it is a larger ſeed than clover, it requires a greater weight of ſeed; if they ſhould be ſowed too thick, they may be thinned with a hoe like turnips, or tranſplanted to fill up vacancies, or into other ground; and, as they are a much more valuable crop than turnips, they will amply repay the expence of hoeing.

As a corroboration of my opinion on broad-caſt ſowing, I ſhall beg leave to quote the authority of the indefatigable Mr. Young, in his Six Weeks Tour. The experiment, as tried by a Mr. Johnſton, near Ilford, in Eſſex, is reported as follows. "Four years ago, laſt ſpring, he marked out three acres of land; the ſoil an *hot gravel*, to ſome depth, as appears from a large gravel-pit adjoining. One acre he ſowed with lucerne, broad-caſt (without any corn); another with the ſame, over barley, broad-caſt; the third he divided into three parts, and drilled them at two feet, two feet and an half, and three feet diſtance. On the corn acre he ſowed five pecks of barley, which yielded him forty-

five

five buſhels; an encreaſe very ſurpriſing. Mr Johnſton aſſured me of the accuracy of the account, as he ſaw the barley meaſured himſelf. The general reſult of the experiment hitherto is, that the drilled lucerne is always earlier than the broad-caſt; but not ſo much as to ariſe to one cutting in the whole year, the latter being cut as often as the former. In reſpect of quantity there is no compariſon, the broad-caſt yielding *nearly double the drills*, conſequently Mr. Johnſton gives it the preference; nor can he yet determine how long it will laſt in the ground. The acre, which was ſown *without corn*, coſt him near two guineas to clean; but after the firſt year he weeded all the broad-caſt piece with an harrow of his own contrivance, &c." Again Mr. Young ſays; "Between Shorn and Graveſend I obſerved two fields of very fine broad-caſt lucerne; one of them of ſeveral growths, having been cut at various times for feeding cattle in racks; and, from the number *of oats amongſt it*, I apprehend it was ſown with that grain laſt year, &c."

A conviction of the great value of this plant in the ſoiling ſyſtem has induced me to dwell rather longer on this ſubject, than perhaps I ought, but by no means as long as I think its importance deſerves.

Burnet ſeems moſt unaccountably to have been alſo neglected; many have complained, that their beaſts did not ſeem to like it; poſſibly this might have ariſen from giving it to them when too old, and at a ſeaſon, perhaps, when

when plenty of other ſucculent food was to be had. From the ſmall experiments I have tried and ſeen, it appears to be one of the moſt valuable plants we are in poſſeſſion of for *winter and ſpring* feeding. Mr. Johnſton abovementioned tried this plant. Mr. Young, in the ſame tour, ſays, "laſt year he fed cows and horſes with the produce; both of which eat it freely, and *even with greedineſs*." Again he ſays, "The landlord of the Crown, at Stoak, has an acre of burnet, which is, I think, three years old; he ſowed it *broad-caſt*, and kept it perfectly clean from weeds a year, at the expence of about two guineas; but it has anſwered greatly, for it has every year yielded a great quantity of hay, beſides luxuriant food, ſo early as the *month of February*, for many horſes; it is a regular crop, and appears to grow very quick. The landlord informed Mr. Young, that in July he mowed it for ſeed, of which it produced as much as he ſold for 5*l.*, and a large load of hay, which *his horſes eat very freely*. *In January it was fed off with ſheep*, being a thick and luxuriant crop. He finds it ſo profitable, that he has ſowed another larger field with it, *with rye* in November, the ſeed for which he kept, *excluſive of the* 5*l.* At Gosfield, the ſeat of Lord Clare, his Lordſhip has a piece of burnet, for the uſe of his deer *in winter*, which anſwers extremely well."

Chicory ſeems to be gaining ground very faſt. For a further account of its value, ſee the fifth number of

the Iriſh Agricultural Magazine, page 17, where its uncommon value *for ſoiling* is clearly aſcertained by Mr. Young. It ſeems to poſſeſs an advantage that, I believe, no other plant does; "it was eaten clean when the ſeed-ſtalks were four or five feet high;" a ſtate in which few, if any, plants are reliſhed by cattle in ſummer.

Canary-ſeed is ſcarcely ever ſowed in Ireland; yet, from many trials made by my late father at Mallahide, it will ſucceed well; but, from repeated experiments, it will not in general ripen the ſeed *equally*, unleſs ſowed early in autumn, nor will it anſwer in poor or ſtiff ſoils.

SECT. 9. *Mode of Hay-making.*

THERE are few parts of farming conducted in a more wretched manner in this county than hay-making. The hay is in general turned, and turned over and over again, until at length it is frequently caught by rain; then it muſt be dried, and this proceſs of turning is renewed and continued, until it is devoid of either the proper colour or ſmell. Frequently this hay is bought by *judges* in Smithfield for *old hay*. The great hay farmers, with which this county abounds, have no longer the ſame excuſe; "The citizens of Dublin would not buy any but long white hay:" a better opinion has taken place, and now *green hay* is very juſtly preferred in Smithfield.

Inſtead

Inſtead of throwing the graſs out of ſwathe immediately after the ſcythe, as generally practiſed; I would adviſe to let the ſwathe remain until the middle of the next day, or till the ground is dry, and then, *without any tedding*, rake it into windrows, and make it into ſmall graſs-cocks *early* in the evening; next morning, or when perfectly dry on the outſide, break it into a windrow again; and in the evening, *before the dew falls*, make it into large graſs-cocks, as much as two men can carry between them. It may remain in this ſtate two or three days; then theſe cocks ſhould be broken up, and made anew into the ſame ſized cocks, placing the hay, that was in the bottom, at the top of the new-made cock; if made up free from rain or *dew*, it will not be injured for ſome days: particular care ſhould be taken to pull the bottoms all round, and lay it on the top of the cock; in a few days the cocks may be gathered in, and made into field-cocks of four or five loads each (about a ton). If the graſs is very thin and dry, much of this labour may be omitted, or the ſmall cocks may be gathered in at an earlier period. I am inclined to think it would be the beſt method to make *field-cocks*, without letting a man on them to preſs them cloſe together, as uſually practiſed; it is probable the hay would ferment more equally (as happens with ſtable dung in making hot-beds), and leſs dangerouſly, if it was put up with a fork and well beaten; Doctor

Anderſon, in his Eſſay on Hay-making, ſeems to be of the ſame opinion, to which I beg to refer the reader.

The method recommended by Mr. Archer is a very good one; but it is no ſmall taſk to get labourers unacquainted with, conſequently prejudiced againſt the practice, to execute it; indeed it will require ſome *firmneſs* even to purſue the method I adviſe, though none but the uſual operations are performed. Permitting mowers to work in wet weather, or when heavy dews are on the graſs, is a very great and a very common error; they ſhould be employed in ſome other kind of work at ſuch times, and paid *by the hour*, which could be eaſily calculated, and their taſk by the acre for mowing ſtill be performed at favourable intervals. Doubtleſs they will expect, and, at ſuch a ſeaſon, deſerve ſome conſideration for this; but it will be well laid out, and amply repaid, in the ſuperior quality of the hay. It will certainly require a good ſhare of reſolution to withſtand their ſolicitations (generally backed by the *handyman of the old ſchool*, which almoſt every gentleman and farmer has about him), to continue cutting on *their* certain aſſurances of the *weather clearing up ſhortly*; *what ſignifies a ſlight ſhower of rain?* &c. &c. Nothing is more common than to hear farmers, and often thoſe that *ought* to know better, ſay, that a ſhower of rain can do their hay little injury, if it has been but recently cut. How he would ſtare at a propoſal to throw all his graſs into the river, and then make it into hay?

hay? ſurely the moſt ignorant would exclaim againſt it, yet I can ſee little difference in the effect.

Hay is very much injured in this county, by the careleſs manner of making cocks, and permitting them to ſtand too long in the field. It is not unfrequent to ſee upwards of a foot at the bottom of the cock quite ſpoiled by this neglect; this to ſome of our great hay-farmers is no loſs, as, with all the bad and refuſe hay of the farm, it is (if not reſerved for cows, which deſerve the ſweeteſt and beſt hay of the farm) lapped up in the inſide of each roll of hay, and loaded for Smithfield. The frauds, that are practiſed in loading hay for this market, call loudly for redreſs; it is a very common practice with many hay-farmers to ſhake a little fine hay on the ground; then a quantity of bad is ſhook evenly over this, and lapped up and loaded for market. In the market the farmer's man ſtands with a handful of hay, drawn from ſome part, that has not been *doctored*; therefore the buyer ſhould previouſly examine the *inſide* of each roll. It is very probable this is the reaſon, that the Engliſh method of ſending hay to market in truſſes has not been practiſed, as it would ſhew the bad hay immediately. It is perfectly ridiculous to ſay, we are not uſed to the mode; it was practiſed ſome years, but was not perſiſted in long enough to eſtabliſh it; if gentlemen would *determine* to adopt it, and not be perſuaded by their *handyman* to deſiſt, it would become in a ſhort time as common here

as

as in London. Nothing can be more diſguſting than a ſtrong well-fed horſe walking ſlowly to market, with 4½ cwt. (frequently much leſs) of hay, and, perhaps, at the moſt, only four or five miles; and, ſtill to add to the loſs, return home without *a load of dung*. There cannot remain a doubt that a horſe, going a ſlow pace with a moderate load of dung, will be leſs injured, than by the uſual furious mode of driving home empty hay-cars. The loſs to hay-farmers by this muſt be very great; for many, I am informed, keep upwards of ten horſes with hay at market twice a week; ſuppoſing them to go only ſix months to market, it muſt make a difference of at leaſt 50*l*; but the frequent loſs of ſeaſons for other work, and wear and tear, muſt make it infinitely more.

Sect. 10. *Dairies—their produce.*

The deficiency in the number of dairy cows muſt, as Mr. Archer juſtly remarks, be a very ſerious loſs to the inhabitants of a populous city; but I can by no means think with him, that the deficiency is not likely to be filled up for many years; for, as ſoon as the dairymen are induced by a proſpect of gain, doubtleſs the number will keep pace with it; from the great plenty of grains, and cheapneſs of potatoes, they have every inducement they can wiſh for, and I have not a

doubt

doubt this will have a very rapid effect in April and May next.

The average quantity of milk produced each day by a dairy in Dublin (eight quarts in ſummer, and five quarts in winter, each cow), appears uncommonly low. When we compare this with the average produce of a London dairy, we are led to imagine there muſt be either ſome defect in the breed or feeding.

If dairymen could be induced to give their cows hay-maſh, or hay-tea with their food, perhaps it might have a good effect.

Potatoes are now at ſuch a price, that it is very probable they would be very beneficial for this purpoſe; certainly the milk and butter would be of much richer quality than that produced by grains and *waſh*; but dairymen are more anxious for quantity than quality.

One of the cauſes of the deficiency, of both quantity and quality, may be in ſome meaſure imputed to the very great careleſsneſs of farmers, dairymen, and even gentlemen, in the choice of their bulls; thoſe in general we ſee with dairymen, are the moſt wretched ugly animals, that can be conceived; few look further than the goodneſs of the cow, and ſtill fewer ever once imagine the bull has any influence on the quantity or quality of the milk or butter; this influence ſeems to be well known and cloſely attended to by the breeders in England, and, notwithſtanding the *ſneers of ignorance*, is

is making its way rapidly amongſt the beſt informed in this country.

Foreſtalling cows, like many other ſpecies of foreſtalling, has lately occupied the pens and tongues of many; but I imagine it is a ſubject of more difficulty than is generally allowed. It has long been a faſhion to raiſe an outcry againſt foreſtalling, monopolizing, flour-mills, flour-factors, &c. &c. It has been aſſerted frequently, that flour and corn have been thrown into the river, that government have had upwards of twenty men many nights throwing flour into the Liffey, and a number of ſuch inflammatory reports. I have made frequent and cloſe enquiries, but could never trace them to any *reſpectable* ſource, and they have always ended in, "*I did not ſee it myſelf, but I know thoſe that did.*" It cannot be ſuppoſed any man would be ſo blind to his own intereſt, at a time when theſe articles were ſo dear, as to deſtroy them, inſtead of ſelling them to the ſtarch-makers, or for feeding ſwine; or that any man would be ſo weak as to truſt his reputation to his porters. Contrary to the opinion of many, I *venture* to think that, if we had a flour-factor in every ſtreet in Dublin, it would be very much for the advantage of the inhabitants; and I alſo *venture* to think that, ſuppoſing no flour-factors to exiſt, it would be only throwing the buſineſs into the hands of the bakers, and would not lower the price in the leaſt to the conſumer. Let us ſuppoſe for a moment (what is often

often really the caſe), that a farmer has to pay his rent on a certain day: he ſends his wheat to market; a glutted market, or an expectation of a reduction, prevents his ſelling: what is he to do? he *muſt ſell*; a corn merchant, who has a capital, *relieves him*, and benefits the public, by ſtoring it, until a period of ſcarcity induces him to bring it into market again. If bakers did not find their account in dealing with flour-merchants, *why not grind for themſelves?* The common-place cant, that our ears have been dinned with for ſome time paſt, againſt flour-mills, flour-merchants, the *monſtrous* profits of farmers, &c. by thoſe, who are totally unacquainted with the ſubject, has led me inadvertently to ſay more than I intended, as I feel myſelf very inadequate to the taſk; but I cannot help thinking, that a man has as much right to employ his capital in this line, as in any other ſpecies of traffic. There are thouſands of ignorant people, that think proviſions cannot be too cheap; they never conſider the ruinous conſequences to the poor farmer that feeds them, and ultimately to themſelves; for without a proſpect of profit, no farmer will cultivate his ground.

If dairymen could be perſuaded to adopt the ſoiling ſyſtem in ſummer, they would find it very beneficial; as their graſs, from the richneſs of the ground, is very luxuriant, therefore more eaſily deſtroyed by the feet of the cows, beſides many other advantages mentioned under the article *Green Food*. As the Dublin milk is

wretched thraſh, it has often ſurpriſed me that thoſe, who have yards, do not keep a cow; ſhe could be eaſily fed with grains, ſmall potatoes, hay, and, very frequently, refuſe vegetables. The winter butter of Dublin is alſo in general very bad, owing chiefly to putting too much hot water to the milk whilſt churning, to haſten the proceſs, and alſo to conform to the taſte of thoſe, who think no butter *nice* but that, which is white.

I muſt think a dairy very incomplete without a ſtove and flues all round it; by which means, with the help of a thermometer, the milk could be always kept to the neceſſary heat, and would produce butter of the *natural* colour and taſte, and which would not ſpoil in a day or two, as the ſcalded butter generally does. Ventilators are alſo indiſpenſibly neceſſary in dairies. Churns of various kinds have been tried, but have in general failed, either from prejudice or ignorance in the dairy-maid, or poſſibly from the fault of the maker.

CHAP.

CHAP. IV.

SECT. 5. *General State of Leaſes.*

MANY tenants, that would wiſh to improve their lands, have not the means. Perhaps it would be an advantageous mode for the landlord to make ſuch improvements as *the tenant wiſhes*, and charge him ten per cent. until paid. I am convinced, in the article of draining alone, great improvements would be effected, as I have ſcarcely ever known a farmer, that was not ſenſible of the value of this neceſſary operation; but how can this be expected from a poor farmer, who with great difficulty can make up his rent? That it would be for the advantage of the landlord, needs little argument to prove. This mode has been adopted in England with great ſucceſs; and, notwithſtanding the common-place ſarcaſms againſt Iriſh farmers, they poſſeſs as much energy, and as much honeſty, as any of the ſame claſs in the world. Perhaps it would be a uſeful clauſe, to oblige tenants to pay an additional rent for fallows, and to make them ſome abatement for green crops *manured for*. It might, perhaps, be alſo uſeful, if farming ſocieties would always give a preference, in every pre-

mium, to thoſe, who *do not fallow*. I need ſcarcely premiſe, that landlords muſt ſhew an example themſelves, by aboliſhing their ruinous ſyſtem of fallowing, before they can exact any thing from their tenantry.

SECT. 6. *Of particular Clauſes therein.*

THE clauſes in leaſes, that prevent breaking up or burning graſs-lands, are very neceſſary in the preſent ſtate of agricultural practices; for the certain conſequence of a permiſſion to plough them up, or burn them, would undoubtedly be repeated crops of corn, until the land would be completely exhauſted. If, on the contrary, farmers could be induced (and I propheſy before many years they will) to adopt the alternate huſbandry, the breaking up graſs-lands would be highly beneficial; and, on their agreeing to this courſe of cropping, they ſhould be permitted to do ſo whenever they thought proper; and I venture to pronounce that, once a farmer purſues this ſyſtem, the ſuperiority in *immediate* profit will induce him to adhere to it.

It gratifies me exceedingly to be able to aſſure my readers, that the good example ſet by ſome gentlemen has tended greatly to wear away prejudices; and that the value of green winter food, and ſoiling in the houſe in ſummer, is beginning to be known, and very much practiſed.

Another

Another advantage of permiſſion to break up graſs-lands is, the opportunity it gives of laying them down evenly for irrigation. The wretched mode, in which graſs-lands are generally laid down in this country, has very frequently prevented the adoption of this improvement; and ſo little are the gentlemen of this county acquainted with the great benefit of this operation, that, when I have propoſed their breaking up, burning the land, and laying down *immediately* to graſs, they are generally *perſuaded* to follow the old courſe, which throws them back at leaſt three years, and then the ground is laid down in an impoveriſhed ſtate.

I am not fond of introducing clauſes prejudicial to the tenant, becauſe I know they have many difficulties to ſtruggle with; but, until they are ſenſible of the value of an improved ſyſtem of farming, I think a clauſe to prevent breaking up their land the laſt three years of their leaſe, and another permitting the landlord or his aſſigns to enter, and ſow the land under corn with clover, or ſuch graſſes as he thought proper, the laſt year of the leaſe, would be highly uſeful.

Mr. Archer very juſtly reprobates the too general mode of taking fines; in addition to the deſtructive effects pointed out by him, I muſt add the injury the national character ſuſtains; for I have very frequently heard Engliſhmen exclaim againſt this practice, as tending to ſtamp us with the character of ſwindlers. So firmly has this cuſtom taken root, that now, if a man

man has only a ſtable, at 6*l.* a year, he will aſk a fine. It is ridiculous enough to ſee advertiſements ſtuck up in waſte lots of ground; "This ground to be let in lots for building, *without a fine:*" ſo far from demanding a fine, I think it would be much more reaſonable to ſay; "This ground will be let for building, *rent free for two years.*" I am convinced this would ſtimulate many to build, that are prevented by having to pay two years rent, and very often more, before they can ſet their houſes, beſides the money expended in building.

We will ſuppoſe a young farmer, with 500*l.* in his pocket, wiſhes to take a farm of an hundred acres; as the laſt tenant generally leaves the land in an exhauſted ſtate, he has to manure the greater part of the farm, and buy ſtock; but inſtead of doing this, and proceeding with ſpirit, he has to pay perhaps 250*l.* as a fine; this cramps all his exertions, and, inſtead of a ſpirited and profitable huſbandry, begun by the purchaſe of manures, &c. he is obliged to adopt the too common ſyſtem of the country, and, diſpirited and liſtleſs, conforms to all the erroneous practices of the neighbourhood. That this picture is not an exaggerated one, the experience of multitudes can bear teſtimony to.

On the other hand, it would be an extreme weakneſs in landlords to let their lands to the firſt adventurer, that came up to their terms, without enquiring into his character, circumſtances, and particularly his

ſkill

ſkill in agriculture; but I am well convinced, that this Iriſh cuſtom has operated more againſt population and agricultural improvements, than any, or all other cauſes put together, and muſt have originated in the management of eſtates getting into the hands of thoſe, who are totally ignorant of agriculture, and to whom the uſe of the money would be profitable. I have touched on this ſubject in another part of this work, and am not a little ſupriſed, that men of penetration are not aware of its injurious tendency.

SECT. 10. *Nature of Fences.*

MR. Dillon, and Mr. Hime, near Roebuck, have adopted an excellent method of levelling down the *land ſide* of the ditch, by which means it is grazed or mowed to the bottom, and very little ground is loſt; but, where this practice is adopted, it muſt be covered with good mould.

A very erroneous practice has crept into the county of Dublin, of leaving their hedges, when cut down, three or four feet high, by which means they are generally bare at the bottom; if theſe hedges had been laid *cloſe to the ground*, they would be quite thick in the bottom, and form a fence in one year, that would annually encreaſe in goodneſs.

Another

Another very material error is, planting very ſmall thorn quicks in new-made ditches: after the firſt heavy rains or froſt, the bank is often waſhed away from them, and they are expoſed to the harſh winds of ſpring, or, when weeding, are drawn out by the leaſt accidental pull. It would be much more economical to give half a guinea per thouſand for *tranſplanted* quicks (the price I underſtand they are ſold for at Meſſrs. Simpſons nurſery at Inchicore), than one ſhilling for one year old. If thoſe, who are making new ditches, will be at the ſmall expence of a trifling quantity of manure, ſpread over the roots of the quicks when planted, they will be amply repaid in the ſuperior quickneſs and ſtrength of their growth. Mr. Archer very judiciouſly adviſes the top of the ditch to be ſowed with furze-ſeed, as it will not only help the fence, but will be an admirable food for beaſts in winter. If a drill is opened, and a ſmall quantity of rotten dung laid in it, and on this the ſeed is ſowed, and covered with the back of a rake, they will make more progreſs in a year, than they would in three without it, as the tops of ditches are in general very poor. The beſt ſeaſon for this purpoſe is April or May, as, if ſowed earlier, they are apt to be deſtroyed by wet weather. It is ſurpriſing, that hollies are not planted by gentlemen for this purpoſe; nothing can be more beautiful than this tree in winter, and they make an admirable fence; if planted, as I have adviſed for quicks, in April or May, they will ſucceed perfectly

perfectly well. As winter is a ſeaſon of moſt leiſure, many are tempted to make ditches at that time, though none can be more unfit, as frequently wet weather or froſts cauſe the earth to fall into the ditch; if the cape ſod was turned, and quicks planted, and covered with earth, the remainder of the ditch might be finiſhed in May or June, when all the danger of wet or froſts is over. But I really muſt think and hope that, at no very diſtant period, the advantage of feeding in the houſe, *winter and ſummer*, will be ſo well eſtabliſhed, as to preclude all neceſſity for *interior* fences of any kind. If thoſe, who have ſmall demeſnes near Dublin, could be induced to try this ſyſtem, and *peremptorily inſiſt* on the execution of it, they would find not only great advantage, but *great comfort*, by having their ſtock *always under their eye*. I beg moſt earneſtly to recommend to *their* ſerious peruſal the fourth number of the Iriſh Agricultural Magazine, page 316, where they will ſee the great benefits of the ſoiling ſyſtem clearly aſcertained by the pen of Doctor Anderſon, in much more forcible language than any I can make uſe of. I have ſeen a good method practiſed in a few places, of laying rows of ſods parallel to the cape ſod, at about a foot aſunder in the face of the ditch; this in a great meaſure prevents the earth from ſliding into the ditch.

SECT. 12. *Mode of Draining.*

WITHIN a few years the value of this improvement has been well known in this county in many places, but, from the improper direction of the drains, much money has been thrown away; for the men uſually employed in this buſineſs are mere labourers, and underſtand only the manual operations. As juſtly obſerved in the Survey, if drains are not made in a direction *diagonal to the deſcent of the ground*, they are of little uſe: from want of attention to this, though ſeemingly of little importance, *ten* drains are frequently made where *one* would anſwer; and alſo, from want of knowing the nature of the land to be drained, they are often made unneceſſarily deep.

In Fingal, and many other parts of this county, ſod-drains have been found to anſwer every purpoſe; where they have failed, it has been occaſioned by ignorance of the method, or not making them with ſods ſufficiently adheſive; and it is oftener cauſed by the careleſs manner of filling them in. The uſual mode is to lay the ſod at one ſide, and the looſe clay at the other; the ſods are laid *on their end* againſt the ſide of the drain; if they are the leaſt weak in the middle, they give way when the weight of the wet earth comes againſt

againſt them, and ruin the drain. I have frequently opened drains, that have been ſtopped, and always found that it proceeded from this cauſe. If, inſtead of this method, the cut was made in the middle, and not in the ſide of the drain, and the ſod laid flat, it would bear equally on each ſide; and if the ſod is cut wedge-ſhape, as I have directed for *lawn drains*, it will divide the incumbent earth equally on each ſide; and even if, in ploughing, a horſe did put his foot ſo deep as to touch the ſod, it would be ſo thick in the middle, and, as the cut is not more than three inches wide, ſo ſtrong, as to bear his weight without injuring the drain. But the greateſt error, and indeed *a moſt common one*, in theſe and in ſtone drains, is *filling in again* all the ſtiff impervious clay, that is thrown out of the bottom of the drain: a moment's conſideration muſt inform any perſon, that it is preciſely cauſing what the draining was intended to prevent—the ſtagnation of water on the ſurface. If, on the contrary, the light ſurface mould *only* is filled in, the water will eaſily penetrate it, and the evil be cured; but as what is taken out of the drain is ſeldom ſufficient for this purpoſe, the top mould ſhould be borrowed from either ſide of the drain; or if gravel or ſand is convenient, it ſhould be filled in to meet the ſurface mould; at all events, *the clay ſhould never be returned into the drain.* I muſt confeſs I have never ſeen *any place*, where the *abſolute neceſſity* of this caution ſeemed to be attended to.

Wherever I have been engaged for this purpoſe, I have been very particular in my directions on this head; but the moment I have turned my back the clay has been *always* filled in. Where ſtones are in great plenty, or ſods ſufficiently tough are not to be had, they ſhould be always preferred. Thoſe, that are uſually made, have the fault Mr. Archer mentions, of being too broad in the bottom; and, if not carefully covered with a thin ſod (the graſs ſide down), ſtraw, heath, ruſhes, furze, &c. they will be in a few years rendered uſeleſs, by the looſe mould waſhing through the ſtones.

Many perſons are poſſeſſed with an opinion, that tapping will drain all kind of wet land. Where the evil proceeds from ſurface-water on an impervious ſoil, tapping is perfectly uſeleſs; but where it is cauſed by ſprings, tapping will be highly beneficial. But I muſt caution young improvers, who try this method, againſt being frightened at meeting with ſtones; *they muſt go through every obſtacle.* This caution I am induced to give, as many have deſiſted at the firſt difficulty that occurred; as ſome encouragement to them to proceed, I aſſure them I have ſeen many ſituations draining at a vaſt expence, that might have been drained by tapping, for perhaps *a few ſhillings.*

Lawn or wedge drains, where the ground *is not to be ploughed*, will be found highly uſeful. I conceive if a ſod, the ſhape of a wedge, about a foot deep, and a foot broad, was dug, and about two inches of the lower angle

angle pared off, and turned into its place again, it would catch the ſurface-water, and conduct it to the other drains. It may be neceſſary to remark, that this is only fit for lawns that will not be ploughed, and where the ſod is adheſive, nor would I adviſe theſe alone to be depended on; they are merely to dry the ſurface quickly.

SECT. 13. *Nature of Manures.*

THE uſe of lime, in reducing tanner's bark to a manure, is not ſufficiently known, as immenſe heaps of it may be ſeen in many places unuſed. In this county, and, I believe, in general through Ireland, lime is uſed in ſuch ſmall quantities, as often to be of little benefit; it has been frequently brought into diſrepute by being uſed on poor worn-out ſoils, totally deprived of any of thoſe ſubſtances proper for the action of the lime; and not unfrequently, on the ſtrength of the liming, another crop is taken from ground, already exhauſted by ſucceſſive corn crops.

As Mr. Archer ſays the lime of this county in general contains ſuch a large alloy of ſand, as from one-fourth to two-thirds, it requires ſome conſideration from farmers poſſeſſed of gravelly or ſandy ſoils; for, if it is of this nature, it would be encreaſing the evil.

Many

Many make up their dunghills with alternate layers of *unſlacked* lime and dung; this is a very bad practice: but if lime is mixed with ſcouring of ditches and roads, moory or boggy ſubſtances, green vegetables, tanner's bark, &c. it will be highly beneficial.

Doctor Anderſon gives ſome rules for the choice of lime, which may be uſeful to farmers. The beſt lime is that, which is whiteſt, lighteſt, and feels ſoapy in the fingers when wet; if gritty, it contains ſand.

There ſeems to be no great danger of farmers uſing too great a quantity of lime; the price in this caſe being generally the guide. Doctor Anderſon gives great encouragement to the liberal uſe of lime; he gives an inſtance where part of a field was limed four inches thick: "The effect was that, for many years afterwards, the grain was ſo immoderately luxuriant, that it fell over, and rotted before it came to the ear." Had Doctor Anderſon, with his uſual perſpicuity, informed us what the nature of the ſoil was, in which this happened, it would have been very material.

The great benefit of lime, in reclaiming bogs and heathy moors, has long been known and practiſed in ſome parts of Ireland, but infinitely ſhort of the quantity that might be done, as there are few ſituations of this nature, that do not produce either limeſtone, limeſtone-gravel, or marle; but the cheapeſt, and moſt laſting of all manures, is certainly *irrigation*: few, indeed, are the places of this kind, where this great improvement

improvement may not be effected at a very moderate expence.

We poſſeſs a kind of black gravel in great plenty in this county, which, although Mr. Kirwan ſays is not limeſtone-gravel, is a very valuable ſort. What its component parts are I do not know, but I have had many opportunities of witneſſing its very beneficial effects.

Peat or turf thrown in a heap to dry and rot, and then mixed with lime, is recommended by Mr. Archer. It is very generally agreed that, unleſs peat is kept moderately moiſt, the lime will not act on it; nor will it rot if kept dry;* this is well known in the improvement of bogs.

I muſt beg leave, in ſome points, to differ with Mr. Archer on the value of peat-aſhes. I agree with him, that *very thin* bogs ſhould very ſeldom be burned; but where they are *not thin*, I hold it to be a very beneficial practice. By what other means can we ſo readily deſtroy heath, and many other ſtrong growing vegetables? and in ſituations remote from lime or other calcareous manures, or where irrigation cannot be adopted, I ſee no other mode of proceeding ſo efficacious. The greateſt danger ariſes here, as in many ſimilar caſes, in taking ſucceſſive *corn crops*, without the intervention of *green ones*; but where alternate cropping

* See Headrick on the Improvement of Waſte Lands.

cropping is purſued, I muſt think any preparation, that gives an immediate power of producing green food for *ſoiling in the houſe*, muſt be very beneficial, as not only the ſhade of turnips, rape, &c. helps the rotting of the peat, but the great quantity of dung produced enables the farmer to extend the potatoe culture, and other food for ſtock, which, but for this, he could not have accompliſhed to ſo much advantage. It is pretty plain, that without cattle he could not have had dung; and equally plain that, without the *green food*, produced ſolely in this caſe by the agency of the aſhes, he could not have ſupported cattle. This helps to ſhew, how intimately connected the improvement of land is with the encreaſe and improvement of the breed of cattle.

Soap-boiler's waſte has been uſed with great ſucceſs in many places, and can be generally had in good quantities. I have ſeen it uſed with great advantage in mortar for building, and the cement formed was uncommonly hard.

Sea-weed, or ſea-wreck, is uſed in conſiderable quantities at the Earl of Howth's; an immenſe heap is now ready for potatoes, which, I am informed, it produces uncommonly well; the collection of it is greatly neglected in many ſituations, that are greatly diſtreſſed for manure. Different opinions are entertained reſpecting the ſtate, in which it is moſt beneficial;

ficial; I am not well enough acquainted with it to offer any thing on that head; but we may ſafely conclude that, as it has ſucceeded well, both in a freſh and putrid ſtate, it is a valuable addition to the catalogue of manures. A further proof of its great value may be ſeen in the Dublin Society's Tranſactions, Vol. I. Part 1. under the article *Kelp*.

CHAP. V.

GENERAL SUBJECTS.

SECT. 2. *Number and ſize of Villages and Towns.*

1. DUBLIN.*—We poſſeſs ſome very fine ſquares; Merrion-ſquare, I am informed, is ſuperior to any thing of

* Having read many different explanations of the name of Dublin, and being ignorant of the Iriſh language, and of ancient Iriſh hiſtory, I applied to a gentleman ſkilled in the language and antiquities of this country, from whom I received the following explanation, which appears to be authentic.

The word *Ibh*, ſignifying a tribe of people, was often prefixed to the family names of the tribes, that inhabited certain diſtricts in Ireland, to expreſs the territory. (See *Ibh*, in O'Brien's Dictionary and General Vallancey's Proſpectus.) as *Ibh-Laoghaire*, now *Iveleary*, in the county of Cork, the country of the O'Learys; ſo in like manner, *Ibh-Conluach*—*Ibh-Mac Cuile*—*Ibh-Failge*—*Ibh-Neil*, &c. &c. &c.

O'Brien has enumerated twenty-two diſtricts, with this prefix.—*Clann*, ſignifying a tribe, children, is ſynonimous, and was prefixed to family names, to expreſs the territories they inhabited; as *Clann Breaſail*, in the County of Armagh; *Clann aodh buidhe*, or *Clanaboy*, in the county of Antrim; *Clann Colmain*; *Clann Feargail*, &c. &c. &c.

Laighean, pronounced *Laihan*, was the family name of the people of the counties of *Dublin* and *Meath*; it is ſaid they obtained

of the kind in London; but, indeed, the manner, in which it is planted and kept, does very little credit to the

obtained this name from being expert at throwing the *Laighean*, or ſpear: be that as it may, *Ibh-laihan* was the name of the territory they inhabited, which, with the word *Du*, a country, formed *Du-ibh-laihan*, i. e. *Dublin*, that is, the country of the tribe of *Laihan*, whence, with the affix *ſtir*, a country, is derived *Laihanſtir*, or *Leinſter*, the name of the province, of which Dublin is the metropolis. Hence the *Eblana* of Ptolemy. *Eblana*, the chief city of Ireland, hodié *Dublin* (Ainſworth).

Eblanicus, ancien peuple d'Irlande; ils occupoient ce que nous appellons aujourdhui les comtez de Dublin et de Meath. *Eblanians*, an ancient people of Ireland: they poſſeſſed that part now called the counties of *Dublin* and *Meath*. (Le grand Dictionnaire Geographique, par Martiniere).

Theſe *Lagenians* were ſo remarkable for their proceſs in war, they were called *Aos-cliathab*, the fighting caſt; whence Dublin was named *Aſcheled* by Ptolemy, who flouriſhed about the year 140. *Ath-cliatha* was a name well adapted to them, ſignifying warriors, that would *renew* the battle. *Ath* is uſed in Iriſh like *re* in Latin; as, *Ath-coghadh*, rebellion; *Ath-faſaim*, to grow again, a ſecond growth, &c. &c.; hence they obtained the name of *Sean-ghaing*, or ancient warriors, a name given by the poets to their territory *Leinſter*. *Claidhit ratha dhamſa for foirb ſean ghaing*, i. e. *for coigidh Chairbre*, i. e. *coigidh Laighean*, that is, "Let them erect a rath for me in the land of the ancient warriors," that is, in the province of *Cairbre*, alias, the province of Leinſter; which ſhews they were as expert at the ſword or *battle-axe*, as at the ſpear; for *Cairb* ſignifies not only a ſword, but a battle-axe; it was the *Charba*, or falcatus enſis, Phœnicum inventum; itaque in Sanchoniathone Phœnicio ſcriptore vetuſtiſſimo, Saturnus ex ferro *Charba* (Joſ. 13. 22.). Balaam occiſus fuiſſe fertur per *Chereb*, in Lingua Chaldæa per *Charba* (Bochart). It was an ancient weapon of the Iriſh, whence *Cairbre* became the name of ſeveral Iriſh warriors and princes, and was prefixed to the names of their territories, as *Cairbre Gabbra*, or Carbury, in the county of Meath—*Cairbre Aodhbha*, now *Kenry*, in the county of Limerick—*Cairbrecha*, in the weſt of the county

28 1806

the managers: inſtead of keeping the graſs *conſtantly rolled and neatly mowed*, it is, like the ground of ſome poor charitable inſtitution, *kept for hay, and ſold to the higheſt bidder*, to help to defray the expences of the *poor inhabitants* of the ſquare. The mode of laying it out was originally bad; it was done *by contract*, of courſe as little was expended on it as poſſible. As the ſoil, in which the trees are planted, was generally taken from the foundations of houſes, and conſequently very bad, none but the commoneſt and moſt hardy kinds have ſurvived; they conſiſt almoſt entirely of dogwoods, lilacs, thorns, and laburnums. If, on the contrary, this bad clay had been *exchanged* for about two feet of the fine vegetable mould, of which the lawn conſiſts, it might have been planted with *evergreens*, which would certainly be more agreeable in winter than the above-mentioned deciduous kinds. The withered after-graſs

of Cork, extending from Bandon to Crookhaven, and to the river of Kenmare.

Theſe names, which are hiſtorical, and can be well authenticated, have given room to numberleſs erroneous etymologies; as *Dubh-linn*, a muddy brook, and *Dub-leana*, the place of the black lake, though the waters of the Liffey are as clear and as pure as any in Ireland; and as *ath* ſignifies a ford, and *cliath* a hurdle, ſome idle authors have found out, that there was a ford here over the Liffey, covered with hurdles, not recollecting that ſuch a paſſage is named *Togher* in Iriſh, and never *Cliath*, which is always applied to what we call *wattles* in Engliſh.

The author of this paragraph propoſes to favour the public ſoon with a Geographical Dictionary of Ireland, wherein the ancient names of territories, mountains, rivers, &c. will be explained.

graſs is permitted to lie (I ſuppoſe *for manure for the meadow*) until covered by the freſh growth in ſpring, and helps to throw an air of gloomineſs over it at that dreary ſeaſon. Indeed there would be an inconvenience in keeping it neat; *carpets could not be beaten in it*, nor could all the *dirty dogs of the town clean themſelves ſo well as in the long withered graſs*; few people would be ſurpriſed if cows were taken in to graze by the week.

Seriouſly, it is aſtoniſhing that theſe things ſhould be permitted by men of fortune and taſte; ſurely, if the management has unfortunately got into hands, that will not improve it, or permit others to do ſo, why not apply to the Imperial parliament for redreſs?

Stephen's-green, in its preſent ſtate, ſcarcely deſerves mention; it is at once a diſgrace to the city, and to thoſe, who have it in their power to improve it. I underſtand ſome overtures were made ſome years ſince, but for what reaſon they failed is beſt known to the parties; if a reaſonable compenſation to the city will not induce them to conform to the wiſhes of the inhabitants, I imagine an application to parliament would relieve them; if, on the other hand, the inhabitants expected any unreaſonable compliances, I ſhould think there would be no more difficulty in adjuſting the difference by a jury, than is every day experienced by the wide-ſtreet commiſſioners.

Mountjoy-

Mountjoy-ſquare, it ſeems, is likely to be finiſhed ſhortly; but I perceive they have committed the ſame error, of filling up hollows with rubbiſh of all ſorts, where it is likely trees are to be planted, and which will coſt the inhabitants no ſmall ſum to remove.

It is ſtrange, that theſe affairs are committed to the random efforts of carters and labourers; and that ſome of the inhabitants, who, from having country houſes, *are uſed to ſuch affairs*, do not attend to it *in time*.

I have frequently heard it aſſerted, that the ſmoke of the town will prevent evergreens from living in any of our ſquares; this I know to be unfounded; and where they do not thrive, it is oftener cauſed by the badneſs of the ſoil (as in Merrion-ſquare), than the badneſs of the air. Certainly ſome of the more tender kinds may not ſucceed, but all the common ones will, eſpecially hollies, which have this further advantage, that they cannot be eaſily injured by handling.

The College-park is capable of, and wants improvement very much, which could be obtained by railing it in on the ſide next Naſſau-ſtreet, and by a taſteful planting, of which it is totally deſtitute. Some improvements have lately been made, under the inſpection of Meſſrs. Simpſon of College-green, which ſhew what may be done, as they have converted that piece of ground oppoſite the Houſe of Lords, which was a great nuiſance, into a very agreeable object. It is to be hoped they will not ſtop here, but continue the improvements.

A handſome

A handſome iron gate might be erected in Park-ſtreet, inſtead of the old wooden one at preſent there; and, by taking in an old houſe or two, it could be made highly ornamental, and would have a fine effect when viewed from Merrion-ſquare. It will be perhaps objected, that opening views to the ſtreet would diſturb the contemplations of the ſtudents; from the noiſe of carriages, and the admittance of ſtrangers at all hours of the day, I ſhould with great deference imagine, that exerciſe, after ſtudying in their chambers, is the only uſe the park is at preſent put to.

The Duke of Leinſter's lawn is capable of great improvement; indeed the arrangement is by no means modern, and, as it is always in full view, requires ſome attention to make it correſpond with ſo ſuperb a manſion. I know not why it happens, that the gardens in Dublin are in general very badly laid out and kept; except that thoſe, who have elegant country reſidences, are apt to deſpiſe their town gardens. The chief reaſon of want of ſucceſs in theſe gardens is, the general practice of throwing out on them all the rubbiſh and bad earth from the foundation when the houſe was built, as practiſed at Merrion and Mountjoy ſquares; if this had been buried in the bottom, and the original good earth brought to the top, many trees would thrive, that are generally thought to be unfit for ſuch ſituations.

St. Patrick's cathedral is permitted to be in a very ruinous ſtate; poſſibly it is thought it would take from the

the antique look, if it was repaired. If this church and Chriſt-church were inſulated and railed in, it would be a great improvement, and only paying a juſt tribute to their antiquity and grandeur.

If the Exchange-ſteps were cut away, and the entrance confined to the elegant one oppoſite Caſtle-ſtreet, it would not only give a breadth where it is much wanting, but this entrance is much eaſier of acceſs, and it would likewiſe help to open the approach to the Caſtle, which is greatly wanting.

We were led to expect ſome years ſince, that Caſtle-market was to be made ſuperior to any market in Europe, and that the preſent one was only temporary; I ſince underſtand, that the idea had no foundation, and that the preſent wretched ill-contrived one is to remain. I do not know, whether it is in the power of the wide-ſtreet commiſſioners to redreſs us; if it is, the ſame taſte, ſpirit, and impartiality, that have hitherto directed their proceedings in the improvement of this city, will no doubt influence them to pay ſome attention to this affair.

New-market alſo poſſeſſes every defect of Caſtle-market. Patrick's-market is ſtill worſe, as the danger of floods is to be added. Some years ſince Sir Thomas Blackhall built a very convenient market in a more healthy ſituation; but, for what reaſon I cannot tell, the butchers ſeem to prefer their old dirty ſituation, and the new market is almoſt uninhabited.

The

The vegetable market, in Mary's-lane, is the moſt wretched and inconvenient one that can be conceived; it is kept in ſuch a filthy ſtate, and the ſize ſo very inadequate to the purpoſe, that few houſe-keepers attempt to go there. There is a piece of ground, very fit for this purpoſe, at the rere of Dominick-ſtreet; it is at preſent, as all waſte ground is, a very great nuiſance, being a depot for all kinds of filth and rubbiſh, and a noted rendezvous for robbers: here a very commodious market might be built, that would at once be a great convenience and ornament to this part of the city; the expence would be trifling, and highly advantageous to the ſpirited proprietor. The fruit-market ſhould alſo be placed here, but apart from that for vegetables; no perſon will deny that the preſent one, on the Coal-quay, is the moſt dirty, uncomfortable one, for both buyer and ſeller, that can be ſeen any where. A potatoe, egg, and fowl market might be alſo advantageouſly placed here, as the more they are connected, the more convenient for both buyer and ſeller.

The corn-market has been long complained of as very inadequate to this purpoſe; poſſibly this market might be alſo brought in contact with the markets I have mentioned above; at all events, in its preſent ſituation it is highly inconvenient, nor is the building at all large enough for the buſineſs tranſacted in it.*

There

* If this idea is adopted, the plan of the new market-houſe at Drogheda is worthy of great attention; it is the

There is an uncommon convenience attending the ſituation I have pointed out; it can have at leaſt four entrances, which, by dividing, would leſſen the preſſure at any one gate.

The new market, near Britain-ſtreet, is an exceedingly neat ſmall market, and does the proprietor, Mr. Caſh, great credit; it clearly ſhews what might be done in other markets, but has the defect of every other market, want of room.

Clarendon-market is alſo well deſigned, but half of it is untenanted.

Sarah-bridge is at once an ornament and reproach to the county; it appears as if the architect was only anxious to build a very ſuperb bridge, which would form a very fine perſpective view, without conſidering the approach to it; inſtead of either carrying the road on a level or an inclined plane, from Conyngham-road to the bridge, it dips about midway, and forms a receptacle for mud and water, that rendered it (until lately that an attempt has been made to mend it) almoſt impaſſable.

Had the entrance to the Phœnix-park been placed oppoſite to this bridge, and the road made to wind gradually to each ſide, it would have formed one of the moſt picturesque and bold objects perhaps in the county.

moſt elegant and commodious building for this purpoſe I believe in Europe.

county. I ſhall always feel great pleaſure in explaining my ideas on this ſubject, and for the material improvement and ornament of the park, whenever I am called on.

Some years ſince there was an idea afloat, of removing all burying-grounds out of the city, which I hope to ſee revived again; they are certainly a great nuiſance; the inconveniencee attending the removal to the ſuburbs would be very trifling: our ideas are now, I truſt, too much enlarged, to permit a veneration for old bones to counteract a propoſal for the general health of the inhabitants.

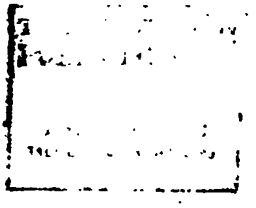
Few cities, I believe, are better ſupplied with water than Dublin; and when the Royal canal company, from the extenſion of their line, will be able to grant a ſupply, there will be a ſtill greater plenty.* As the water in the Baſon is in general very muddy, and comes clear to the houſes, there muſt be a depoſite ſomewhere; I imagine this might be prevented, by filtering *all the city water* through gravel, which could be very eaſily and cheaply effected. As timber for pipes

* It is very probable the ſtream, that ſupplies the city at preſent with water, might receive a conſiderable addition, by a little attention to the mountain ſtreams, which perhaps could be eaſily diverted into its channel. It is alſo very probable that, by purchaſing mills on ſome larger ſtreams, any quantity neceſſary might be had on terms, that ought not to weigh a moment with the inhabitants of an opulent city.

is every day encreaſing in price, and the expence and labour of renewing them very heavy and inconvenient to the inhabitants, I preſume they might be made to laſt infinitely longer, by ſlightly burning or charring *both inſide and outſide*; it is a well eſtabliſhed fact, that wood by this practice is rendered almoſt incorruptible; if it anſwers this purpoſe, an experiment could be eaſily tried at a trifling expence. As the pipe-water tax is, I underſtand, very inadequate to the expenditure, I preſume a ſmall addition would not be thought a grievance by the inhabitants, when they for a moment conſider the great bleſſing of plenty of pure water. Many houſes pay only ten ſhillings per annum for what would coſt them at leaſt twenty pounds, if they had not pipes. Doubtleſs, on application to parliament, a ſmall extenſion of the annual tax would be granted, without which I underſtand it could not be encreaſed.*

I do not know if it is poſſible to dock in the river Liffey; if veſſels could be at all times water-borne, it would be a very great convenience; poſſibly the public ſewers of the city might be injured, or poſſibly mountain floods might prevent the adoption of the idea; yet I imagine it might be contrived by means of ample overfalls, to prevent any danger on this head. I merely throw out the hint for the conſideration of thoſe

* Since I wrote the above, I perceive this idea has been taken up, and is now before the Imperial parliament.



1763; the part beyond the blue, dotted and shaded the extent of the city in 1798.

Dominican friars. Mary's-abbey was then the extent of that part of the town (called Oſtmantown, corruptly Oxman-town) to the eaſt, and north-eaſt from thence to the ſhip-buildings, containing Capel-ſtreet, Abbey-ſtreet, Mary's-ſtreet, Jervis-ſtreet, Stafford-ſtreet, Henry-ſtreet, Great Britain-ſtreet, Summer-hill, Marlborough-ſtreet, Henrietta-ſtreet, Bolton-ſtreet, Domnick-ſtreet, Dorſet-ſtreet, Paradiſe-row, Eccles-ſtreet, Rutland-ſquare, Great Denmark-ſtreet, Great George's-ſtreet, Mountjoy-ſquare, Gardiner's-ſtreet, Bereford-place, Cumberland-ſtreet, Glouceſter-ſtreet, Meklenburgh-ſtreet, Earl-ſtreet, and Sackville-ſtreet. Theſe, with a great number of other ſtreets and lanes, have been ſince laid out in that quarter. On the other ſide, to the weſt, Michan's-church and Church-ſtreet (ſo called from thence) were for the moſt part the bounds, and all weſtward of them, as far as the Barracks and Montpelier-hill, taking in Bow-ſtreet, Smithfield, Haymarket, Tighe-ſtreet, Queen-ſtreet, Blackhall-ſtreet, N. King-ſtreet, Brunſwick-ſtreet, Linen-hall-ſtreet, Anne-ſtreet, Lurgan-ſtreet, Coleraine-ſtreet, Beresford-ſtreet, and many other ſtreets and lanes, have increaſed on this ſide. Grange-Gorman, Stonybatter, and Glaſnemenoge, now united to the town, were then villages at ſome diſtance from it; in the latter of which places the ſheriffs of Dublin have been known to hold their courts in the times of the plague, and particularly in the year 1575,* as being remote from the city.

On

* Lib. Alb. Eccl. S. Trin. Dub. MS.

On the ſouth ſide of the Liffey the city hath been likewiſe much enlarged ſince the year 1610. The ſpace of ground now occupied by Crane-lane, Eſſex-ſtreet, the Cuſtom-houſe, Sycamore-alley, Temple-bar, Fleet-ſtreet, Aſton's-quay, Townſend-ſtreet, &c. &c. was then under the dominion of the water; and George's-quay, with a large tract of many acres extending to Ring's-end-bridge, has been recovered from that element. Dame-ſtreet contained then only a ſhort range of buildings on the north ſide, and extended no farther than to the precincts of the Auguſtin monaſtery, not three hundred feet in length, oppoſite to the end of George's-lane. The diſſolution of that religious houſe made room for enlarging the city eaſtward, the precincts whereof were firſt converted into gentlemens houſes and gardens, ſuch as the lord chancellor Euſtace's, John Crow's, and others, which were again demoliſhed, and converted into ſeveral ſtreets, as Euſtace-ſtreet, Crow-ſtreet, at the end of which, near Temple-bar, has been erected the new theatre-royal, on the place where the ſaid monaſtery formerly ſtood, Fownes's-ſtreet, and others. The parts oppoſite to the then Dame-ſtreet were principally taken up by St. Andrew's church and church-yard, which at that time ſtood very near to Dame's-gate, and on a part of the ſite of that church and church-yard Caſtle-lane, now Palace-ſtreet, and the houſes adjoining were laid out, and

on

on the remainder the old Caſtle-market was built by Alderman William Fownes and Thomas Pooley, Eſq. in the year 1704. The church of St. Andrew was before that time removed further eaſtward near the College, where it now ſtands. George's-lane was nearly the extent of the ſuburbs to the eaſt, and was then but ſlenderly built, and thinly inhabited; though we are told by Mr. Stanihurſt,* "that it was antiently a place of more conſequence; but that the inhabitants thereof, being daily and hourly moleſted and preyed on by their prowling mountain neighbours, were forced to ſuffer their buildings to fall into decay, and to embay themſelves within the city walls." The ſame writer adds, "That a place therein (called at the time of his giving that account in 1586) Collet's-inns, was in ancient times the ſeat of the king's exchequer; but that once, the baron ſitting in it ſolemnly and careleſsly, the Iriſh laid hold of the opportunity, ruſhed in, ſurprized the unarmed multitude, ſlew all that fell under their power, and ranſacked the king's treaſure; after which miſhap the exchequer was removed from thence into a place of greater ſecurity." That author gives no account when this accident happened; but it appears from records, that the ſite of the old exchequer was on the 28th of July, 36 Edw. III. (1362) granted in cuſtodium to the prior and friars of the Auguſtinian order in Dublin (which lay in the neighbourhood of it) for

* Deſcription of Ireland in Hollingſhed, p. 23.

for the profits whereof they accounted in the 17th year of Richard II. (1393) as appears by a pipe roll of that year in Birmingham tower. The place, nevertheleſs, though abandoned as to its original uſe, retained the name of the Exchequer long after, which it communicated to a lane called Chequer-lane, built in the year 1610, and extending from George's-lane to Grafton-ſtreet. Stanihurſt proceeds,* "That there was in that lane (namely, George's-lane) a chappell dedicated to St. George, likely to have been founded by ſome worthy knight of the garter; that the mayor, with his brethren, was accuſtomed with great triumphs, and pageants yearlie on St. George's feaſt to repair to that chappell, and there to offer; but that the chappell had beene of late razed, and the ſtones thereof, by conſent of the aſſemblie, turned to a common oven; converting the antient monument of a doutie, adventurous, and holie knight, to the coal-rake ſweeping of a puf-loafe baker." This chapel was under the care and government of a maſter and wardens, and ſupported chiefly by oblations; for which reaſon the parliament thought proper to take it under their protection, and by a ſtatute† provided, "That whatever perſon in the county of Dublin ſhould make any prey upon the Iriſh enemies, exceeding forty cows, ſhould deliver one cow, or five ſhillings in money, towards the reparation of

* Deſcription of Ireland in Holingſhed, p. 23.

† Rot. Cancel. 36 Hen. VI. No. 19.

St. George's chappell in Dublin, and an action was given for the recovery of the ſame to the maſter and wardens thereof."

A village, called Hogges, lay without ſide the city walls, and eaſtward of George's-lane, in which a nunnery, under the invocation of the B. V. Mary, was founded by Dermod Mac-Morough, king of Leinſter, about the year 1146, before the arrival of the Engliſh in this kingdom. It is not improbable, that the village took its riſe as well as name from the nunnery; for *agh* in the Iriſh language ſignifies a *virgin*; and, removing the aſpirate, H, the word by an eaſy corruption may paſs into *Hogges*, as much as to ſay, *the place of the virgins*. Be this as it may, the village is mentioned in ſeveral early charters, particularly in one made about the year 1206 by Sir Jeffery de Conſtantin to the abbey of Triſternagh * in the county of Weſtmeath, whereby he grants to the ſaid abbey one meſſuage without the walls of Dublin, near the village of Hogges; and Hoggin-green, whereon St. Andrew's church now ſtands, which took up a large ſpace of ground extending to the river Liffey, is often mentioned by the Iriſh hiſtorians, as the common place for the execution of criminals, among whom, to give one inſtance, Adam Duff O'Toole was in the year 1327 burned here for hereſy and

* Archives of Triſternagh, MS. chart I.

and blaſphemy.* This village is now united to the city, and the whole green taken up by buildings; though at the period mentioned, ſcarce any thing but that little village, the ſites of the ſaid religious houſes, a Bridewell for the reception of vagrants, and an hoſpital, where the parliament-houſe now ſtands, were to be ſeen. A place alſo on this green was anciently called Hoggen-butt, where the citizens had butts for their exerciſe in archery; and near them was a ſmall range of buildings called Tib and Tom, where poſſibly the citizens amuſed themſelves at leiſure times by playing at keals or nine-pins. This practice ſeems to be hinted at by an old proverb, though not applied to this place, namely, *he ſtruck at Tib and down fell Tom.* We find theſe buildings called Tib and Tom, mentioned in the will† of Richard the firſt earl of Cork, as mortgaged to him by Theodore lord Dockwra, and the lady Anne his mother, for three hundred pounds, and rented from the mortgagee by Sir Philip Perciral, at twenty-four pounds per annum.

On the eaſt and ſouth of George's-lane (the churches of St. Peter and St. Stephen, and the College excepted) little was to be ſeen but encloſed fields. Stephen's-green was then ſo called, which took its name from the neighbourhood of the church of St. Stephen, and no

* Campion's Hiſt. of Irel. p. 86. Chron. in Hollingſh. p. 69.

† Prerog. Office.

improvements were on it; nor was there then any open ſtreet or paſſage from thence to the College but round through George's-lane. A part of Keivan's-ſtreet was indeed then built, and ſome reſidentiary houſes of the prebendaries and canons of the cathedral of St. Patrick, together with the archbiſhop's palace. From hence the reader will have a juſt idea of the growth and increaſe of the city in theſe quarters, when he ſees that Chequer-lane, William-ſtreet, Stephen-ſtreet, Clarendon-ſtreet, S. King-ſtreet, Grafton-ſtreet, Anne-ſtreet, Duke-ſtreet, Dawſon-ſtreet, Moleſworth-ſtreet, Kildare-ſtreet, Frederick-ſtreet, Merrion-ſquare, Merrion-ſtreet, Leinſter-ſtreet, Naſſau-ſtreet, Clare-ſtreet, Holles-ſtreet, Baggot-ſtreet, Leeſon-ſtreet, Harcourt-ſtreet, the buildings about Stephen's-green (which is one of the largeſt ſquares in Europe, being almoſt an Engliſh mile in circumference), York-ſtreet, Camden-ſtreet, Aungier-ſtreet, Peter-ſtreet, Cuffe-ſtreet, with many other ſtreets and lanes, have been added to it ſince the period before-mentioned. The ſame thoughts will occur, when he views the weſt and ſouth-weſt parts of the town, and ſees what few ſtreets or buildings then extended weſtward or ſouthward of Newgate, except Francis-ſtreet, James's-ſtreet, and Thomas-ſtreet, and the precincts of churches and religious houſes.

The Black-Rock is capable and worthy of great improvement; the leading one ſeems to be an encreaſe of the

the ſupply of freſh water, with which, I underſtand, it is at preſent but ſcantily furniſhed. From viewing the ground (without taking the level) I imagine a fountain could be erected, where the pump formerly ſtood, and where the open pump-hole ſtill remains a moſt dangerous and reproachful nuiſance; it could be very eaſily aſcertained, and, if practicable, executed at a ſmall expence. The next improvement, that preſents itſelf, would be paving the ſtreets, and preventing the inhabitants from throwing dirt on the road or foot-path. The carriage-ſtand in the principal ſtreet is another very great nuiſance, that could very eaſily be removed to the waſte piece of ground near Mr. Kelly's new erected houſe of worſhip. As this is a very riſing village, I am not a little ſurpriſed the proprietor or the inhabitants do not pay a more ſpirited attention to it; the many charming ſituations in its neighbourhood, and the contiguity to the ſea, muſt always enſure it a preference to every other outlet. The Hibernian Magazine of March 1802 led me to view Montpelier parade, between the Rock and Monkſtown church; it ſtands unrivalled in point of ſituation and proſpect; in front a moſt extenſive view of the Bay of Dublin is moſt agreeably broken by the Hill of Howth, Ireland's Eye, Lambay, and the country in the vicinity of Clontarf: in the rear nothing can be more pictureſque; it includes a great range of the moſt delightful country, boldly terminated by the mountains. It is aſtoniſhing, that citizens would prefer

prefer the noiſe and duſt of the Rock to a ſituation like this, that unites the retirement of the country to all the advantages of the town, without any of its diſadvantages. A few of the houſes, I perceive, remain ſtill unſet; but when citizens reflect on the ſuperior advantages they enjoy, and the rapid riſe, that is likely to take place in the rents of this neighbourhood, I am convinced that Mr. Greene, the ſpirited proprietor, will be amply and quickly remunerated, and the tenants ſufficiently recompenſed for any money they may expend.

Gentlemens Seats and Improvements.

THIS is a ſubject, on which I feel a conſiderable difficulty. To find fault with a gentleman's demeſne is to me an unpleaſant taſk, and, as *I have found lately*, a dangerous taſk for a profeſſional man. Yet it would certainly by no means anſwer the Society's views to have defects and beauties indiſcriminately praiſed; if this were the caſe, improvement in any ſcience could never be obtained; and I muſt conceive, that every perſon, writing for this purpoſe, ought to conſider, that he is employed by *the nation*, and not to feed the vanity of individuals at the expence of ſincerity. What opinion muſt foreigners have of our Surveys, if places are held up to public view, that have no one good point to recommend

commend them? I am convinced Mr. Archer has in this, as in many other things, been miſinformed, or I am equally well convinced he would not have brought many places into notice, that do not deſerve either public obſervation, or the very high encomiums he has beſtowed on them. The following places come under either of the above deſcriptions—Curduff—Turvey—Buſhy-park—Terrenure—Liſſen-hall—Seafield—Portfield—Kilmactid (James Farrel, Eſq.)—Mount-Sackville—Milltown—Drumcondra—Broomfield—Diſwell's-town—and ſome others.

As I have ventured to find fault, I feel great pleaſure in being able to point out ſome demeſnes, that do great credit to the taſte of the proprietors; and at the ſame time I hope I will be permitted, without giving offence, to offer a few hints for their further improvement.

Abbeville, the ſeat of the Right Hon. John Beresford, I preſume to think might be much improved, by removing the two hedges on each ſide of the road leading to Mr. Sayers's, and making a ſunk fence, as adopted by Sir William Gleadowe Newcomen at Killeſter. If this was done, and as much of the plantation along this road cut away as would throw it into handſome clumps, it would not only give a very extenſive view of the country, but would help to break that *line of uniformity*, which has been ſo frequently adopted in plantations. As the view is exceedingly confined on the ſouth ſide, it is the more neceſſary to open it on this.

this. Had the gardens been originally made on the oppoſite ſide of the road, near the landry, it would have contributed greatly to the beauty of this fine demeſne.

Belcamp, the ſeat of the Hon. Francis Hutchinſon, poſſeſſes a valley capable of being made very beautiful, by removing the trees in the loweſt part, and throwing the whole under water. It was intended by the late proprietor to make a number of *petty falls*, which it is hoped Mr. Hutchinſon's good taſte will reject.

Killeſter, the ſeat of Sir William Gleadowe Newcomen, is particularly happy in a ſituation for an entrance, and Sir William's fine taſte has profited by it. The good effect of a ſunk fence may be ſeen here along the road leading to Raheny. If I may preſume to ſuggeſt an improvement, it would be to take away thirty or forty yards of the hedge on both ſides of the road to the weſt of the entrance, and make a ſunk fence; this would give an idea of extent much wanting here, as the thorn hedge too plainly marks the boundary; the ground on the oppoſite ſide belonging to Sir William, there can be little difficulty. In ſome part of this demeſne, as well as in *every other*, the ruinous effect of neglecting to thin plantations *in time* may be ſeen, as the ſtems are bare in many places, and give a view through them, by no means agreeable at all times; but gentlemen are at length beginning to be convinced of the neceſſity of this operation at an early period, and

Sir

Sir William is too experienced a planter to be the laſt to profit by it. The gardens at Killeſter have long been pre-eminent, particularly for vines and pine-apples; they are deemed by all good judges to be equal, if not ſuperior to any in the united kingdom.

Clontarf Caſtle is a very fine antique, and kept in high preſervation by Mr. Vernon. An attempt was lately made to give it elevation, by taking away ſome of the earth in front; to make this either ornamental or uſeful, it ſhould have originated at a conſiderable diſtance in Clontarf town, ſo as to have made it an inclined plane from the hall-door; this could be eaſily effected, and would make Clontarf caſtle one of the fineſt objects of the kind in the county; it would alſo materially ſerve the inhabitants of Clontarf town, as their houſes are very much ſunk, owing, I ſuppoſe, to injudicious road-making. If Mr. Vernon ſhould ever be inclined to adopt this hint, it is hoped he will remove the dwarf battlements in front.

Marino, the ſeat of the Earl of Charlemont, was highly improved by the late Earl: from its contiguity to the city, and the great facility of viewing it, a deſcription would be ſuperfluous. It is in contemplation, I underſtand, to make a new entrance, which has been long wiſhed for. This demeſne has ſuffered ſeverely by an ill-judged ſpeculation in building a creſcent of houſes, that poſſeſs every inconvenience of a city reſidence, without any of the retirement or pleaſures of

the country. It will ſcarcely be believed that, at the diſtance of two miles from the city, there are houſes without either gardens or good water. Some attempt at improvement has been lately made, by throwing the road farther from the houſes, and giving a ſmall ſpace for gardens in front. If all the diviſions between theſe inſignificant gardens were removed, and thrown into one lawn neatly mowed, dotted with a few hollies or other evergreens, and a ſkirting of evergreens along the paling next the road, I imagine it would have a more rural appearance than the preſent taſteleſs patches; and if only one entrance, and more in the centre, was made, it would make it more retired; at preſent it is made a thoroughfare very diſagreeable to the inhabitants.

Holly-park, the ſeat of Jeffry Foot, Eſq. poſſeſſes one of the moſt enchanting views in the neighbourhood of Dublin. It enjoys in the foreground all the beauties of Marly, and the diſtant proſpect takes in a vaſt ſcope of improved country, finely relieved by the back-ground of the mountains, and a wide expanſe of ſea, agreeably broken by Howth, Ireland's Eye, Lambay, &c. In the Iriſh Agricultural Magazine, No. 3, page 279, I took the liberty of ſuggeſting what I conſidered would be an improvement to Mr. Foot's demeſne, that is, to remove the high hedge to the eaſt of his entrance, and alſo, to remove his entrance further to the weſt. Although he has not thought proper to adopt it, I have had

had frequent opportunities, whilſt engaged at Marly, of being convinced it could be eaſily accompliſhed, and would be a very material improvement.

Marly has obtained a very juſt eulogium from Mr. Archer's pen; it is indeed a truly elegant demeſne; and as Mr. Latouche has become ſenſible of the neceſſity of thinning his plantations, thoſe at Marly, contrary to plantations that are *not thinned*, will continue to increaſe in beauty and value every year, as in general they have been taken in time. I muſt caution thoſe, who intend to thin their plantations, to do it *gradually*, otherwiſe, in expoſed ſituations, much injury may enſue, and alſo to recollect that *cutting down timber*, and *thinning ornamental plantations*, are very different both in their deſign and effect, and by no means to be entruſted to the direction of the generality of planters or ſtewards. If I may venture to hint an improvement at Marly, it would be to reſtore the part of the rivulet next the houſe to nature, by taking away two ſmall ill-contrived water-falls, and permitting the ſtream to take its natural courſe; this would be a fine contraſt to the ornamented part of the ſtream, which at preſent, though very elegant, has rather too much ſameneſs. I alſo preſume to hint the neceſſity of a bridge over the rivulet, near the grand entrance, which, by bringing the approach to the eaſt of the preſent one, would prevent the view of ſo much road from the gate, give a view of a fine plantation, and carry the approach

more

more *on a level*; to the weſt of the bridge the water might be extended, and, at a ſmall expence, made exceedingly beautiful, either ſeen from the bridge, or from the ruſtic cottage on the hill; the preſent ſtream only ſerves to put one in mind, that ſomething is wanting, and does not by any means correſpond with the elegance of the ſurrounding ſcenery.

It is no eaſy matter to ſay any thing of Stillorgan, it has been ſo completely cut up by the proprietor; every perſon of taſte muſt regret, that ſo fine a demeſne fell into ſuch hands. The only thing, that looks like improvement, is a very beautiful new approach, executed by the late Mr. Leggatt, which appears to be uſeleſs at preſent. It is neceſſary to caution the inexperienced againſt a mode of planting adopted here; ſmall holes are made in the top of four ditches, and the roots of trees ſqueezed into them; any ſuggeſtions for improvement would be uſeleſs.

Nothing can be more aukward than the approach to Mr. Ambroſe Moore's houſe: by not originally advancing the houſe beyond the line of the garden wall, there is no opportunity of hiding the garden wall with trees, and this cauſes a ſteep diſagreeable zigzag turn cloſe to the houſe. This gentleman ſeems to deſpiſe all view of the bay, as he has planted large growing timber-trees along his wall in front of the houſe, which in a few years will ſhut out all proſpect. If evergreens only had been planted to hide the wall, I imagine it would have

have had a much better effect, and certainly at much leſs expence; this is an error gentlemen near Dublin are very apt to fall into.

The viceregal lodge in the Phœnix-park is capable of great improvement; but until a new approach is made, nothing to the purpoſe can be effected; the preſent one is the worſt conducted in every reſpect, that can be ſeen any where. A very elegant one might be ſketched out near Mrs. Talbot's houſe, ſuperior, I preſume to think, to any thing of the kind in this county, perhaps in the kingdom; one that would at the ſame time be ſuitable to the repreſentative of majeſty, do honour to the taſte and liberality of the Iriſh nation, and be ſuitable to the elegance of the houſe.

Woodlands (formerly Luttrel's-town), the ſeat of Luke White, Eſq. is a truly magnificent demeſne; and the improvements daily making, added to its fine ſituation and great extent, muſt enſure it a ſuperiority over every other demeſne in the county. Nature has thrown the ground into the moſt delightful and undulating variety of ſurface; the views of the river Liffey are caught in her moſt enchanting points; the fore-ground, to which nature has been ſo very laviſh, is broken in the moſt pictureſque manner by the charming plantations of Edmunſbury, Woodville, Hermitage, &c. &c. and the diſtant proſpect cloſed in the happieſt manner by the mountains of Wicklow. The glen is particularly beautiful; it follows the courſe of a natural rivulet, flowing

flowing over a rocky bed between ſteep banks well wooded, forming a moſt agreeable ſolitude without gloom, and poſſeſſing infinite variety. This demeſne contains upwards of four hundred acres, and is embelliſhed with more and better full-grown timber than is to be found in any other in the county. Mr. White is annually adding to the plantations, and improving the ſoil; for this purpoſe the fine lake near the caſtle was laid dry in the ſummer of 1800, and upwards of 60,000 loads of choice manure raiſed from the bottom, which, after having been mixed with a large proportion of lime, was laid on the land, and has produced, as might be expected, the beſt effects. Some opinion may be formed of the ſpirit, with which improvements are carried on in this demeſne, when it is known, that upwards of ſeventy people are employed through the year, beſide many additional hands in harveſt: this is the true method of relieving the poor, and muſt in a philanthropic mind give birth to ſenſations unknown to thoſe many thoughtleſs landholders poſſeſſing thouſands of uncultivated improveable acres, and ſurrounded by an unemployed tenantry; though at the ſame time, if they conſulted their *intereſt only*, it is very evident, that every ſixpence they expended in this manner would return with a large intereſt into their pocket in an encreaſed rent-roll.

The caſtle has the appearance of antiquity; although the chief part of the building has been erected within

theſe

theſe twenty years, yet uniformity as to its gothic appearance is preſerved; and although a part of it is near ſix hundred years ſtanding, the additions are ſo appropriately attached, that the whole has the appearance of having been built at the ſame time; and if it is not as ſplendid a reſidence as ſome in its neighbourhood, it certainly poſſeſſes all the conveniencies, that elegance and comfort can require. It was a grant from King John (who was in Ireland in the year 1210), and one of the apartments is ſtill called *King John's chamber.*

The noble elm-tree near the old-mills, ſo long the glory of Luttrell's-town, and the admiration of every perſon of taſte, was unfortunately broken off within about ten feet of the ground, by the great ſtorm in January 1802. I have been favoured with the dimenſions of this father of the foreſt, as taken by the Reverend Gilbert Auſtin.

	Feet.	In.	
4 feet from the ground;	14	9	circumference.
15 ——————;	4	9	diameter.
79 ——————;	1	0	ditto.

Much to the honour of Mr. White, he intends to preſerve this precious ſtump, which, it is probable, will ſhoot out again, and continue for many years to add to the picturesque beauties of its native ſpot. It is very difficult, from the tranſient view I have had of this demeſne, to ſuggeſt any improvements, yet I imagine opens might be made with fine effect, as the caſtle ſeems

ſeems to be ſhut in; but this requires extreme caution, and a thorough acquaintance with the probable effects they might have, and poſſibly, on a more intimate knowledge of Woodlands, I might relinquiſh this idea.

SECT. 3. *Habitation, Fuel, Food, and Cloathing of the lower Rank—their general Coſt.*

NOTHING can be a greater reproach to the landed proprietors, than the wretched appearance of labourers cottages. Covetouſneſs, want of ſpirit, or careleſſneſs, are the general cauſes. If a landholder builds a miſerable hut, which coſts him only ten pounds, he charges at leaſt forty ſhillings per annum; ſome, as Mr. Archer ſays, the enormous rent of three or four pounds. It is aſſerted, that in many places labourers are accommodated with cabbins gratis; the truth in general is, that, although they pay no *money* for it, they pay labour, which is the ſame thing, as, in making an agreement, this is always brought into the account. It is ſurprizing, that any perſon of the leaſt ſpirit can bear to ſee ſuch wretched hovels near their houſes, yet they are to be ſeen almoſt every where in the county. Sir Thomas Lighton has ſet an example near his houſe on Merrion-road, adjoining to Mr. Frank's lawn, by the erection of a range of cottages; they are at once comfortable to the tenants, and highly ornamental to the neighbourhood.

hood.* Mr. Jackſon, at Clonſkeagh, has alſo erected very comfortable cottages for his workmen; ſome few others may be ſeen, but they are in general as I have ſtated. Want of elevation above the damp earth ſeems to be a great error even in the beſt conſtructed, as there is ſcarcely one but has a ſtep *down into it*: this glaring, and, I muſt add, cruel defect, is in general to be ſeen in gentlemens entrance-lodges. Nothing would be more likely to attach a labourer to his employer, than his having what he would conſider *a bargain*; when a man pays more than the value of his cabbin, he becomes careleſs, as he thinks a change cannot be for the worſe. If, on the contrary, a cabbin that coſts ten or twelve pounds is ſet to a labourer at twenty ſhillings a year conditionally, whilſt he works with the proprietor, without ſtopping any thing *additional on this ſcore* out of his weekly hire, it would tend to make this claſs of men more reſpectable, and then there would be ſuch a ſtruggle for it, that the proprietor would have an opportunity of picking and chooſing men of the beſt character. Except in the immediate vicinity of Dublin, a labourer ſhould have as much ground, at a very moderate rent, attached to his cabbin, as would ſupply his family with potatoes and other vegetables, and graſs for a cow; this would give employment to him after

* The tenants by no means ſecond his views, as the road before their doors is generally in a very filthy ſtate, and the doors and windows very dirty.

his uſual working hours, and tend to keep him from the whiſkey-houſe, and it would alſo give conſtant employment to his wife and children. If labourers had theſe comforts, it would make them fond of home, and I hope we ſhould ſhortly have many *Britton Abbots** in Ireland.

There is no part of the kingdom, in which the lower claſſes are ſo badly ſupplied with fuel as in this county; yet, as Mr. Archer very juſtly remarks, it is no eaſy matter to redreſs them; unleſs landlords would buy coals at firſt hand, and deal them out in ſmall quantities at firſt coſt, I know not what to adviſe. The operation of the canals in this caſe, either with reſpect to coals or turf, has but a very partial good effect; and until very ſmall canals are made to ramify in every direction, this county will be little benefited by them.

I would wiſh to recommend ſtrongly the mode adopted by the Right Hon. David Latouche at Marly. He has attached a griſt-mill to his threſhing machine, for the purpoſe of grinding meal for his labourers; this, with the beſt potatoes in ſmall quantities at wholeſale price, is a very comfortable addition to their wages, which are *not lower on this account*; it takes them out of the hands of huxters, and the apprehenſion of loſing theſe benefits helps to make or keep them honeſt.

* The name of a celebrated Engliſh labourer.

Price of Wages, Labour, and Proviſions.

LABOURERS wages, during the late ſcarcity, were very inadequate to the price of proviſions; and, as I have obſerved before, if it had not been for the meal-ſhops eſtabliſhed by ſubſcription, and the beneficence of individuals, many families would have literally periſhed; now indeed the great plenty of the neceſſaries of life enables a labourer to ſubſiſt tolerably well on his wages, which are in general from ſeven to eight ſhillings a week; frequently milk is added.

If labourers were paid on Saturday at dinner hour, I imagine it would be a good practice; it would enable their wives to provide in time for the enſuing week. It is too much the cuſtom in many places to pay workmen late on Saturday night, or often on Sunday morning; if on Saturday night, they too often adjourn to the public houſe, and frequently are induced, although otherwiſe ſoberly inclined, to ſpend great part, often the whole of their week's wages; if on Sunday morning, it is a very improper day to buy proviſions, and Monday is frequently broken into for this purpoſe. Whilſt the diſtilleries were ſtopped, we ſcarcely ever ſaw a drunken man, but now they may be ſeen in every direction; and until the magiſtrates (aſſiſted by landholders) root out private whiſkey-houſes (I wiſh I could ſay licenced

ones) we muſt never expect either ſobriety or honeſty amongſt our labourers.

We were led to expect, that the eſtabliſhment of friendly ſocieties would have been effected before this; of their beneficial tendency there can remain little doubt; for, if conducted with prudence, they muſt ultimately tend to improve the morals and manners of the lower claſſes of the community. The ſociety for ameliorating the condition of the poor, I underſtand, are moſt laudably occupied on this ſubject; from their influence and arrangements we may ſhortly expect the accompliſhment of this very deſirable inſtitution.

Many complaints are daily made of the diſhoneſty of labourers; how can any other conduct be expected, when the uſual queſtion to a labourer, on aſking for employment, is, "*Have you a ſpade?*" inſtead of "*Shew me your diſcharge from your laſt employer,*" when perhaps he had juſt come from the perpetration of the moſt horrid crimes. If it was made a general rule through the kingdom to employ no labourer, that could not produce a ſatisfactory diſcharge, it would be a great check, and a ſtimulus to good behaviour. Farming ſocieties I hope will take up this idea; and if aſſociations for this purpoſe were entered into, it would redound more to the credit and advantage of landholders than thoſe, that have been formed for ſettling the wages to be paid to their workmen; for, however grating and unpleaſant it may be to their *acquired* feelings, I muſt

beg

beg leave to think, a labourer has juſt as much right to take advantage of a ſcarcity of labour at market, or to expect a higher price for ſuperior abilities, as a farmer has to expect a higher price for his corn in a ſcanty market, or for that of a ſuperior ſample. I muſt confeſs I never knew a merchant, farmer, or tradeſman, that did not act in this manner. From men of enlarged ideas I have nothing to apprehend for this opinion; but many, I fear, will think it great preſumption in a man ſo little known to attempt to dictate; I truſt no perſon will be ſo uncandid as to imagine I would wiſh to palliate or countenance the lazineſs, frauds, and ingratitude of too many of the labouring claſs; I have too often experienced them myſelf to be an advocate for them; but I alſo know, that petulance and pride in employers very often cauſe the moſt amenable labourers to forget themſelves.

SECT. 6. *Uſe of Beer and Spirits—whether either, or which is encreaſing.*

THE apprehenſion of an encreaſe of drunkenneſs from the cheapneſs of whiſkey, though in ſome meaſure it has taken place, yet by no means in that extreme degree we had reaſon to dread; this muſt certainly be attributed to the great improvement in malt liquors; and I venture to prognoſticate that, if the brewers continue

tinue to improve the quality of their drink, the conſumption of whiſkey will gradually decline; for I am very well informed, that one of the moſt celebrated dram-ſhops in Dublin complains, that the lower claſs have very much abandoned the uſe of ſpirits in favour of malt liquor.

SECT. 7. *State of Roads, Bridges, &c.*

IT is almoſt needleſs to expatiate on the utility or pleaſure of good roads; it is the conſtant theme of every county of Dublin Grand jury; and, from the attention, that has been paid to the ſubject lately by men of fortune, one would naturally expect, that the roads leading to the metropolis would be the beſt in the kingdom; that this is not the caſe a very ſhort ride will prove; it will appear the more extraordinary, when the great ſums of money annually expended are known. Indiſcriminate praiſe of our roads is no uncommon thing; if they are good, it muſt be only by a compariſon with others; but I never can think a road good, that is either full of mud, or covered with large *looſe* ſtones, or ſtudded with large *fixed* ones like an ill-made pavement; nor can I ever deem a road made or kept as it ought to be, whilſt a ſtone larger than a walnut riſes on the ſurface. Many will doubtleſs be aſtoniſhed at this aſſertion, and aſk, how is this garden-like management

nagement to be applied to roads? ſimply, by ſorting the gravel *in the pit*, by ſcreens made for the purpoſe, and not by laying down *round ſmooth ſtones* as large as a man's head, and *fine ſand* mixed together, as practiſed on the Black-rock road, and indeed on almoſt every other, and this frequently, I may ſay always, on the hard ſurface. Does it ever ſtrike the makers of roads, that *round ſmooth ſtones laid on a hard ſurface can never unite*, more eſpecially when the medium is fine ſea or river ſand? Surely a moment's thought muſt or ought to convince them, that they muſt remain juſt as we ſee the Black-rock road, the ſtones rolling about the road, and the ſand flying in clouds with the leaſt breath of wind: even if the road was picked (as every road ought previouſly to be), large round ſtones and ſand can never ſink equally under the preſſure of heavy wheels; and, from their ſhape, round ſtones cannot remain firm, for every time a wheel ſtirs them in dry weather, the ſand ſteals under them, and at length they are thrown out on the road, where they roll about, laming horſes, and breaking the ſprings of carriages, until ſtopped by the ditch, or are ſcraped off in the mud. I have lately ſeen, on this and Donnybrook road, men employed to pick the looſe ſtones off; how much eaſier would it be to prevent this, by ſcreening in the pit? This defective management has ariſen from a very general opinion, that gravel for roads could not be *too ſtrong*, and from roads being made or repaired by the perch, without limiting

limiting the ſize of the gravel. One of the bad effects of this injudicious mode is, that the roads are worn in either one or two tracks; if, on the contrary, it had been ſheeted with fine gravel, it would be equally uſed in every part.

With the profuſion of materials almoſt on the ſpot, and the great breadth of the Black-rock road, it might eaſily be made and kept the beſt road in Ireland; but before this can be accompliſhed, the ſyſtem muſt be entirely changed, and the management committed to perſons properly qualified, and not left to the diſcretion of ignorant and bigotted men, *who keep carts for hire.* The regulation for making the drivers of carriages keep at different ſides of the road is a moſt excellent one, but is very ſeldom obſerved by any but hackney carriages. The miſmanagement has alſo extended to the foot-path of this road, and to that of every road, except the Mallahide road; it is covered with large gravel, without a particle of loam to bind it, and ſo rugged in ſummer, that it is exceedingly painful to walk on it; and in winter the level is ſo bad, it is generally full of pools of water. It is ſcarcely poſſible any perſon can be ſo infatuated or ſtubborn, as not to ſee and remedy this cruel neglect; well may thoſe, who uſe them daily, ſay, "the truſtees never walk;" if they did not think proper to ſcreen the gravel, it might be very eaſily raked, and the coarſe rakings laid in hollows in the road. If this had been done, I dare ſay it would remain

main firm and good for ten years or more, and be always dry in winter, and free from duſt in ſummer. Many gentlemen have wiſhed, that this road could be watered in ſummer; it could be accompliſhed at a very moderate expence, on this and every road in the county, which I will point out if applied to. Making roads very high in the middle is another very great and common error, from an opinion that water runs off more quickly; ſo it undoubtedly would, if the ſurface was always perfectly ſmooth and firm; but as moſt carriages wiſh to keep in the middle of theſe high roads, both for ſafety and eaſe, there is generally a deep rut worn in the middle, or if there is the leaſt mud in the road, the indenture made by the wheels will cauſe the water to remain, let the declivity be ever ſo great, unleſs there is a *longitudinal* fall, as recommended in Vol. I. page 199, of the Communications to the Board of Agriculture, and which deſerves great attention. Hedges, high walls, or plantations near roads, are more injurious than is generally imagined; it is not a little extraordinary, that there ſhould be an act of parliament to enforce the cutting of hedges, and none, *I believe*, to prevent the erection of high walls, or planting trees, which are ſtill more hurtful. Until an act of parliament is obtained, to oblige the proprietors to cut down theſe plantations adjoining roads, we never can expect them to be good.

When a better ſyſtem of road-making is eſtabliſhed, the enormous waſte of the public money, that has taken place, will be truly aſtoniſhing; and I am convinced, until a *National Board of Roads* is eſtabliſhed, we never can expect matters to mend; for then the grand cauſe, *grand jury jobbing*, will ceaſe, and the conduct be thrown into the hands of ſcientific and practical road-makers.

Some time ſince I had an opportunity of obſerving the proceſs of repairing a road near the metropolis; it was neceſſary to raiſe it in ſome places upwards of eighteen inches higher than the original level; inſtead of laying thin ſtrata of earth at a time, until made firm by the wheels of the cars, the whole depth was laid on *at once*, and *immediately* covered with broken ſtones. By any perſon, not entirely ignorant of road-making, the conſequence might have been eaſily foreſeen; after the firſt rains, the ſtones, by the preſſure of the wheels, ſunk into the ſoft clay, which by degrees was all purged up to the ſurface, conſtantly ſcraped off, and more broken ſtones added, until they came in contact with the old firm ſurface; ſo that the public had to pay for an *additional* depth of eighteen inches of broken ſtone, beſides paying for removing the mud; and that ſome judgment may be formed of this expence, I have frequently obſerved the labourers give from ten to fifteen blows of a hammer to one ſmall ſtone, and very deliberately lift it off the ground each time; if a ſtraw or

hay

hay rope had been coiled round the anvil-ſtone, with the aſſiſtance of a forked ſtick, more than one blow to a ſmall ſtone need ſcarcely ever be given. I have ſeen a ſmall boy on Mr. Ogilby's eſtate in the county of Derry, that, with a forked ſtick in one hand, and a hammer in the other, would break more ſtones in one day, than any of theſe labourers would in four. The idleneſs of forty or fifty men makes no ſmall item in the expence of making a road. I feel great regret in being obliged to ſtate theſe errors, as the gentlemen concerned deſerve every praiſe for their *good intentions* to ſerve the public; no mens' private character can ſtand higher in public eſtimation; but they will, I hope, pardon me when I obſerve, that their general ignorance of rural affairs, eſpecially of the ſubject before us, renders them very unfit for ſuch undertakings, and totally unable to detect the faults or impoſitions of thoſe they are neceſſarily obliged to employ.

If half of this road had been made at a time (as I have ſeen practiſed on Drumcondra road), and, when firm, the other half, it would have prevented all cauſe of complaint; but the eye of the Right Hon. John Foſter was over Drumcondra road.

It has been always too much the cuſtom of this county to gravel the roads on the old hard ſurface in *ſummer*, and not unfrequently with *water-worn* large gravel, and fine ſand mixed; this is ſo prepoſterous, that I am aſtoniſhed to ſee it permitted by men of underſtanding;

derſtanding. Hollows ſhould undoubtedly be filled up at all ſeaſons; but I muſt contend for it, that hollows ſhould never be permitted in a *well attended* road, but inſtantly filled, if only requiring a ſhovel-full; not indeed in the uſual mode, by tumbling in a cart-load of large ſtones; every carriage avoids them, and the road is worn unequally. If more attention was paid to what is paſſing *below the ſurface* of roads, much money would be ſaved; for I imagine it muſt ſtrike any perſon of common underſtanding, that tumbling round ſtones into a hole of water, or liquid mud, only hides the defect, but does not cure it. In ſome other parts of this county I have obſerved roads covered a foot deep *at once* with wet ſtrand mud, and large round ſtones mixed; ſuch a body of ſo ſoft a material, laid on *at once*, is after the firſt rains converted into puddle, and ſcraped off, and thrown into heaps; then a freſh ſupply of the ſame mud is laid on, and the ſame proceſs continued. Other parts of this road are covered (I cannot ſay mended) with limeſtone *rocks*, without any covering of gravel, which, until the aſperities are worn off, is a moſt dangerous nuiſance. How very eaſy would it be to make this a fine road, by breaking the limeſtone ſmall, and covering it with only two inches of gravel, or even the ſtrand mud would anſwer for this purpoſe.

Great attention is paid by ſpirited individuals to roads; I am convinced they only want a hint of the proper mode. Some parts of all the roads I have ventured

tured to condemn are, I allow, made with gravel of the right kind; but I hope I will not be accuſed of ill-nature, if I ſuſpect it has been accidentally, as the perſon, who loaded it, happened to come to a good vein of gravel; if it had been intentional, why not make the whole road in the ſame manner? A remarkable inſtance of all the errors I have hinted at may be ſeen at the Green-hills, in the road to Tallagh, which *runs through gravel-pits.*

Nothing ruins roads ſo much as permitting mud to accumulate on the ſurface; on many roads it is upwards of ſix inches deep; no road, let it be ever ſo well conſtructed or made, can ſtand this great neglect. Men ſhould be conſtantly employed by the truſtees to ſcrape the roads, and it ought to be drawn away *immediately*, not permitted, as we frequently ſee, to lie for months a dangerous nuiſance. If it was drawn to proper depots, and ſold once a year by auction, I am well convinced it would pay all expences; whilſt the cleaning of our roads is left to the caprice of individuals, we never can expect they will be properly attended to. Every exertion ſhould be made to keep the road dry; this is a fundamental rule never to be departed from, unleſs they can be occaſionally waſhed, as practiſed in ſome parts of England with the beſt effects.

It has often ſurpriſed me, that the managers of roads do not endeavour to ſave the great expence of picking roads

roads by men. From the reſult of an experiment I tried at Sir Thomas Lighton's, I do not entertain a doubt, that every road in Ireland could be *ploughed, harrowed, and rolled*, as eaſily as a garden walk; it is only proportioning the power to the reſiſtance. When I was engaged at Merville Lodge, amongſt other improvements, I changed the line of approach; during an abſence occaſioned by an accident, I found the men had given it a moſt extraordinary riſe in the middle (I ſuppoſe to make it *ſtrong*), where it was near eighteen inches deep, of very large and very hard gravel; it had been uſed for ſome time by very heavy carriages, and was extremely firm, inſomuch that labourers with pickaxes performed very little work in a day; I ſuggeſted the practicability of ploughing it, and as Sir Thomas is ever ready to try experiments with great ſpirit, he agreed; it was accompliſhed in a very ſhort time by a common plough (although a moſt wretched inſtrument for the purpoſe) and four weak mules, with the aſſiſtance of a man to hold down the beam of the plough; this is the ſtrongeſt proof that can be adduced of its practicability, for if it had been tried with four ſteady bullocks, and a ſuitable plough, it could have been accompliſhed with the greateſt eaſe; for the mules were ſo very unſteady, that frequently, when the plough met with any reſiſtance, two of the mules would give back, and two plunge forward, a circumſtance well known to thoſe, who uſe unſteady horſes;

but

but trained bullocks ſtick to the draft without giving back: after being ploughed it was harrowed, the large ſtones picked off, levelled, and well rolled by a heavy metal roller. I am convinced nothing would contribute more to the goodneſs of our roads, than frequent rolling with a *very heavy roller*.

As there are many different opinions on the proper ſhape and mode of making roads, I beg leave to ſuggeſt, that an experiment to aſcertain this is greatly wanting, which can only be done by making a few perches in every different form, and with different materials; for this purpoſe I imagine about an hundred perches of road would be ſufficient, and a road much frequented would certainly be the moſt eligible; no road would anſwer this purpoſe better than the Black-rock road in every point of view: the materials are convenient; it is very much uſed; and almoſt every country gentleman, when he viſits the city, takes a ride on this road, and, on his return to the country, can report the effects of the experiment to his neighbours at the aſſizes.

I will with great ſatisfaction conduct the experiment, if applied to by the Board of Works, Dublin Society, Farming Society of Ireland, or Truſtees of Roads, who may have the *ſpirit* to accept the offer, *without any emolument whatever*; and I hope by this means to be able to make a report, that can be referred to at any future period.

I underſtand

I underſtand Roſs Mahon, Eſq. has made an admirable road in the county of Roſcommon, and alſo Mr. Rawſon, near Athy, in the county of Kildare; as we may hope to have the proceſs detailed in the Statiſtical Surveys of theſe counties, I barely mention them, that they may not be overlooked.

A road continued along the Liffey from Uſher's-iſland, through the Hoſpital-fields, and under Inchicore to Chapelizod, would be exccedingly convenient, as it is perfectly level the whole way.

Knockmaroon-hill, near Chapelizod, has been long complained of for its difficult aſcent; I am convinced, from a view of the ground lately, that this could be eaſily prevented, by carrying the road through Mr. Nixon's ground along the river, and round the hill oppoſite Mr. Chambers's houſe. As this road is much frequented by gentlemen of fortune, I am ſurpriſed ſome attempt has not been made; indeed the whole of the low road from Chapelizod to Lucan wants alteration, widening, draining, and incloſing very much. The Man of War hill might receive the ſame improvement; alſo the road to Dundrum ſhould be brought from the bridge near Tawney church along the hill belonging to Mr. Sherlock, until it meets its level on the hill of Dundrum. A road is much wanting from the Black-rock road to Donnybrook road near Merrion; this could be eaſily brought through Mrs. Nowlan's ground almoſt oppoſite Prieſt-houſe, where a communication

nication between the two roads would be a very great convenience, as in floods there is no communication nearer than Booterſtown.

There is alſo a road greatly wanting from Rathgar road, to communicate with the new road through the commons of Crumlin, which runs near Mr. Grange's mills; a lane to the north of Mr. Shaw's demeſne points out the direction it ſhould take; this would give a ready communication with the great Naas road.

The preſent approach from the Circular road to Sarah-bridge is a very ill conducted one; if the hill oppoſite the Royal Hoſpital gate was lowered, and filled into the hollow oppoſite the artillery barrack, and into another hollow nearer to the bridge, it would not only eaſe the aſcent, but in ſome meaſure amend the miſtake the architect made in the level of the bridge; it would give an elevation to Kilmainham gaol, and prevent the accumulation of mud oppoſite the artillery barrack; if more earth is neceſſary, it can be had in plenty oppoſite the gaol, where it is at preſent worſe than uſeleſs. A remarkable inſtance of neglect occurs daily on this road; a ſtream of water iſſues from St. John's-well, which, inſtead of being directed into the oppoſite ditch, is permitted to follow the direction of the wheels down the declivity, and keeps the road conſtantly in puddle; a man in *five minutes* would clear the paſſage. Another very great and dangerous neglect is, permitting the ſinks oppoſite the barrack to re-

main uncovered. All theſe things tend to convince me of the neceſſity of eſtabliſhing a *Board of Roads.*

If a road, continued from the road between Marly and the Little Dargle, was carried nearly *on a level*, until it met the Scalp road, it would be highly uſeful and ornamental, as it would ſhorten the road at leaſt three miles, and afford one of the moſt charming rides in the county. Another very uſeful, and ſtill more beautiful road, might be made conſiderably higher up the ſide of the mountains of Dublin, which, if carried *nearly on a level*, would interſect all the paſſes into theſe mountains from beyond Saggard to the Scalp, and form a communication greatly wanting; it would alſo connect theſe roads more intimately with the great military road now making in the county of Wicklow; it would be a very great means of improving theſe dreary waſtes, for it would give an opportunity of ſeeing many ſituations highly improveable, that are at preſent only known to a few ſportſmen, who go there to ſhoot; I am convinced, if this road was accompliſhed, citizens would be ſo ſtruck with the charming proſpect from it, that we ſhould ſhortly ſee villas riſe up in every direction, as the improvement of waſte land is not of that difficult nature, that was formerly imagined. The three moſt material improvers of mountain, marle, limeſtone-gravel, and irrigation, are, as ſtated in the county of Wicklow and county of Dublin Statiſtical Surveys, to be had almoſt every where in theſe mountains.

Watering-

Watering-places on roads, for horſes and cattle, are very neceſſary; for want of theſe horſes are frequently watered near the city in dirty pools: there is no road where they might not be very eaſily conſtructed; there could be one erected on Donnybrook road, almoſt oppoſite Platanus, where a conſtant ſtream runs; another could be erected on the Rock road, near Merrion; another could be amply ſupplied from St. John's-well, near Sarah-bridge; in ſhort there is no road, that would not afford many ſuch ſituations. For this purpoſe ſtone-troughs, raiſed three feet from the ground, ſhould be erected, by which means the water would be always pure, and carriage-horſes could be watered without letting down the bearing-rein; the overflow might be caught in a receptacle of a *foot deep only*, which would anſwer for waſhing or cooling the feet of horſes or cattle.

Croſſing-places to the footpaths of roads are in general moſt ſhamefully neglected; a perſon has frequently to wade ancle deep for ſome diſtance through mud and water, as has been the caſe all through this winter, from Leeſon-ſtreet to the late Judge Hellen's gate, on Donnybrook road; if a temporary paling had been erected, the ſcrapings of the road would have helped to make a path; and there is oppoſite to this, a large quantity to ſpare of hard ſtuff, that, with a covering of gravel, would have made a path; if the road had *even been ſcraped in time*, it would have been ſome alleviation, but

but no ſort of notice ſeemed to be taken of it. Oppoſite to Lord Charlemont's demeſne on the North Strand, another pregnant proof may be ſeen of this neglect; in fact it may be ſeen on *every road* in the county of Dublin.

Though not exactly under its proper head, I muſt expreſs my ſurprize, that the ſtinking ſwamp between Glouceſter-ſtreet and Aldborough-houſe has been ſo long permitted to annoy the neighbourhood of Summer-hill and the adjoining ſtreets; in warm weather it is ſufficient to breed a peſtilence, and, if neglected, muſt annually encreaſe in its baneful effects. I have frequently viewed the ground, and do inform the inhabitants, that the nuiſance could be removed and prevented for a very moderate ſum of money.

SECT. 8. *State of Navigations and Navigable Rivers.*

As government have at length embraced the idea of inland navigation on an extenſive ſcale, we may expect it will be executed with rapidity, and without partiality to the proprietors of land. I am convinced, when the value of irrigation is better known, the *annual rent* of water for this purpoſe will not be one of the leaſt profitable branches of revenue; if the ſupply could be encreaſed

creaſed (and doubtleſs it may), I ſhould not be in the leaſt ſurpriſed, if it exceeded the receipts for the tonnage of goods. When canal companies are prepared for this buſineſs, I will be able to lay before them a plan for encreaſing their revenues very materially, with even their preſent ſupply of water; I preſume I need ſcarcely adviſe them to be very cautious, how they part with water for mills or machinery of any kind.

Very ſmall canals, branching out in every direction, as ſtrongly recommended by Dr. Anderſon in his Aberdeen Report, would be of infinite uſe, both for the tranſport of goods and for irrigation; the expence would be very trifling, as they could be conſidered merely as a large ditch.

I conceive a canal from Mallahide, carried under Liſſenhall-bridge, and into the interior of the country, could be eaſily effected; if the tranſport of coals only could be accompliſhed, it would be highly advantageous; but another very material object is connected with it, the improvement of upwards of 1,500 acres of ground, chiefly the eſtate of Mr. Talbot; this could be executed with great eaſe, and at a comparatively ſmall expence; from the nature of the ſtrand, I am certain that, with the aſſiſtance of irrigation (which could be eaſily practiſed), the greater part of it might be made worth at leaſt 4*l.* per acre, as it could be moſtly converted into meadow ground.

A canal

A canal from Dalkey to the Grand canal docks, and another from Sutton,* have been for ſome time ſpoken of as likely, at no very remote period, to be carried into execution; of their uſefulneſs there can be probably but little difference of opinion; and, from the reports of very able engineers, we have every aſſurance of their practicability; every ſtorm adds but too many melancholy teſtimonies of their neceſſity; although the ſums neceſſary for this ſtupendous work muſt neceſſarily be large, yet ſurely it ought not to weigh a moment with a great commercial nation; they will be highly uſeful in bringing labour to a level, which the war has ſo long diverted out of its channel, and which, without ſomething of this extenſive nature to ſettle it, might ſubject us to all the evils attendant upon idleneſs.

If canal companies laid out a large piece of rich ground, for the purpoſe of training elm-trees to plant on their banks, they would find it very advantageous, as, with proper management, they would always have a ſufficient quantity of their own; and by giving them room, they would be able to ſtand ſuch expoſed ſituations. The great value of the elm-trees now growing on the Grand canal near Dublin, ought to ſtimulate them to make ſome exertions for this purpoſe; had this

* The idea of a canal from Sutton, or cutting through the iſthmus at Howth, is not a new one; it was agitated upwards of ſixty years ago.

this been purſued with ſpirit as faſt as the banks were raiſed, what an *immenſe* property would have accumulated by this time?

SECT. 13. *State of Farming Societies.*

FARMING SOCIETY OF IRELAND.

NOTHING can more ſtrongly mark the high opinion, that is generally entertained of this Society, than the daily acceſſion of new members. The following regulation, propoſed by their ſecretary, Mr. Hamilton, is likely to advance the knowledge of agriculture throughout Ireland, more than any other that could be deviſed. Mr. Hamilton attends every day from twelve to three o'clock, at the Society's rooms, No. 34, New Sackville-ſtreet, to give every information on agricultural ſubjects, to even the moſt ignorant farmer, and to receive and circulate the experiments and information communicated by agriculturiſts from every part of Ireland. As a ſtrong proof that prejudices are greatly weakened, and that farmers view this regulation in the light intended by the Society, numberleſs applications are daily, nay hourly made for information; and it muſt be highly gratifying to the members, and to the community at large, to be aſſured that, amongſt the ſubjects, for

for which information is required, the moſt conſpicuous are, a courſe of crops for recovering the fertility of land exhauſted by too ſevere cropping; the moſt economical uſe of green winter and ſpring food; ſoiling in the houſe winter and ſummer; and irrigation.

Although the exertions of intelligent and ſpirited individuals of this Society, to improve the live ſtock of this country, have been crowned with every ſucceſs they could wiſh, yet they have not always been rewarded with the praiſe they certainly merit; for the breeds they have ſelected, with ſo much expence and trouble, have been by ill-nature and prejudice called the *faſhion of the day*; if it is a faſhion, none, I preſume, has ſo beneficial a tendency; but that there is ſomething more than faſhion in it, it is only neceſſary to obſerve that, of all the cattle and ſheep that have received premiums, there has been ſcarcely one, but what have derived their perfections from the improved breeds; and as a ſtill ſtronger proof, not only gentlemen, but profeſſional graziers are emulous of croſſing *their* beſt breeds with the new improved ones. On that queſtion, which has been ſo often agitated, "Which is the long-horned new Leiceſter, or improved ſhort-horned Tees-water cattle, the beſt breed?" it would be very great preſumption in me to offer any thing, as it is a ſubject, which has divided the opinion of the moſt intelligent graziers of the united kingdom; but if I may venture to hint a wiſh, it is, to ſee the *improvement* of our native Kerry breed purſued by

by ſome *unprejudiced* ſpirited breeder; poſſibly by judicious croſſing, or, more probably, by *ſelection*, a very valuable breed for ſome ſituations and purpoſes might be obtained.

The very ſpirited compariſon made by Sir William Gleadowe Newcomen, in importing the moſt ſelect heifers of the two moſt eſteemed breeds in England, does him infinite honour, and muſt in a few years throw great light on a ſubject, which is not ſo clearly aſcertained as the advocates for each breed would ſeem to think.

The eſtabliſhment of farming ſocieties in many parts of Ireland proves at once the high opinion, that is generally entertained of the great uſefulneſs of this Society, and gives us every reaſon to expect, that the ſpirit of agricultural improvement, ſo completely rouſed, will ere long prompt us to take every advantage of the bounties of nature, for which our country is ſo remarkable.

This Society, in aid of the exertions of other ſocieties, grants 10*l.* to thoſe, whoſe ſubſcriptions amount to 100*l.* and upwards; but an encreaſe of parliamentary aid will enable them to extend this to other not leſs uſeful ſocieties, for I entertain a hope of ſeeing farming ſocieties in every pariſh; and, as a conſequence of this, I alſo entertain a ſtrong preſentiment that, at no very diſtant period, fallowing will give place to green crops; and, as a natural conſequence, feeding

in the houſe the year through will follow, which, from every information I have been able to procure, no perſon ever abandoned that once practiſed it.

With great pleaſure I ſeize this opportunity of congratulating the Caſtleknock Farming Society on the reſult of their ploughing match in June 1802. I was well ſatisfied, that ploughs with only two horſes, without a driver, only wanted a fair trial to convince every unprejudiced perſon of their ſuperiority; the very great neatneſs of the manner, in which the two-horſe ploughs of Mr. Garnett and Mr. Roarke finiſhed their work, ſeemed to ſtrike every farmer preſent; I was highly gratified to find much of former prejudices wearing away faſt. It is moſt earneſtly hoped, that Mr. Troy, and the other gentlemen of the neighbourhood, will ſeriouſly reflect on the heavy loſs they muſt ſuſtain by their ſyſtem of fallowing, and great waſte of labour; for ſurely a moment's reflection muſt convince them there muſt be *ſomething wrong* in that mode of tilling ground, that permits thiſtles and other weeds *two feet high* to grow, where vetches or other green crops would better anſwer *every purpoſe*; and that the form of the plough, that requires four or ſix horſes or oxen to draw it, muſt be imperfect either in its form, or mode of ſetting; for though it was evident, that Mr. Garnett's two horſes were leſs diſtreſſed than Mr. Doyle's four bullocks, yet the difference in the depth was by no means ſufficient to account for it.

SECT. 16. *Plantations and Planting.*

THE liſt of regiſtered trees given in the Survey does but little credit to the ſkill of the planters; it will be found on inſpection that, of upwards of 70,000 trees, 3,904 larch *only* have been planted; whilſt 4,495 mountain aſh are regiſtered, one gentleman alone has planted 300 larch, and 1,800 mountain aſh! This ſurely needs no comment from me. Great numbers of the trees generally planted in this county are the very refuſe of nurſeries, or picked up *as bargains* from hawkers or jobbing gardeners; but as we may expect from this, and from unſkilful planting and bad management, that very few of theſe trees will ever arrive to the ſtate of timber, they are ſcarcely worth noticing, except to put thoſe, who wiſh to be informed, on their guard.

I imagine, if a clauſe to limit the age was inſerted in the act for regiſtering trees, it would have a very beneficial tendency, and help to prevent the numberleſs miſerable plantations, that citizens, unacquainted with ſuch affairs, are *prompted* by intereſted people to make.

Nothing has injured the plantations of this country more than the univerſal neglect of timely thinning; and I conceive that, if a premium, tending to effect this purpoſe, was offered by the Dublin Society, it would be of infinite uſe; for if it had even no other effect, it

would point the attention to this moſt neceſſary and neglected operation. The Society ſhould at the ſame time, by limiting the diſtance, at which the trees ſhould ſtand at each cutting, prevent the miſchief, that would attend a too ſudden expoſure, as I have obſerved before in ſection 2. This is an operation, that requires more taſte and judgment than may perhaps be generally imagined, and by no means to be entruſted to the generality of planters; as cutting down trees for timber, and thinning plantations for ornament, require very different abilities. I cannot too ſeverely reprobate the common mode of a *total extirpation* of wood, that very generally prevails through Ireland; if, on the contrary, a taſteful ſelection was made, the receipts would be little diminiſhed, and the appearance of woodineſs ſtill preſerved.

If larch-trees of three or four years old were planted thick, ſuppoſe one foot aſunder, I imagine they would be found one of the moſt uſeful trees we poſſeſs for hoops, as they poſſeſs a durability, when cut at an early age, ſuperior to moſt trees; at this diſtance they ruſh up with great rapidity, and would be nearly of the ſame dimenſions their whole length; as the roots always take an horizontal direction near the ſurface, they are with the greateſt uſe ſtubbed up, which in a thick plantation is of great conſequence: if, when they are fit for ſmall hoops, they are judiciouſly thinned, a ſufficient quantity may be left to grow for hop-poles,

or

or for many domeſtic purpoſes, for which they are peculiarly fit; and when *theſe* are cut down, a ſufficient quantity may be left for timber. There is one advantage attending theſe trees, that graſs growing under them ſeems to be of a more *kind* nature than that, which grows under the drip of any other tree. I beg to refer my readers to Doctor Anderſon's Eſſays for a fuller account of this moſt uſeful and truly elegant tree, than is conſiſtent with the nature of this work; there is one proof of its great durability, which I do not recollect to have ſeen in his eſſays; the ancient Romans called it "immortale lignum."

SECT. 18. *State of Nurſeries within the County, and Extent of Sales.*

THE ſales, until lately, were very trifling; but now that gentlemen are making up for their loſt time, the nurſeries are again ſtocking with young trees. Mr. Simpſon's nurſery at Inchicore is now trenching, and completely ſtocking with ſeedling trees of all ſorts; from its elevated ſituation, there is every reaſon to conclude, that trees removed from it will ſucceed in expoſed ſituations, where thoſe from cloſe nurſeries muſt generally periſh, or at leaſt merely exiſt. As Mr. Simpſon, aſſiſted by his younger ſon, has given up the whole of his attention to the nurſery buſineſs, there can

can be little doubt it will be carried on with ſpirit; and that the ſame candour, which has always ſo ſtrongly marked their dealings, will ſtill continue to be exerted.

SECT. 20. *Quantity of Bog and Waſte Ground.*

WE muſt add to the quantity of waſte ground, mentioned by Mr. Archer, all that extenſive ſtrand, belonging to Lord Fitzwilliam and others, between the Light-houſe and the Black-rock on the ſouth ſide; and another extenſive ſtrand, partly the eſtate of Mr. Vernon, between the Light-houſe and Clontarf on the north ſide. Theſe waſtes are all reclaimable; we may ſee, by what has been done on the North ſtrand, of what they are capable, although the lots have by no means received the improvement they might have done, if in the hands of a man of ſpirit. That part of this ſtrand, near Ballybough-bridge, purchaſed ſome time ago by the late Marcus Beresford, Eſq. might have been long ſince under meadow, but for the very erroneous method of laying the floor of the arch of Anneſley-bridge, which has been made ſo much higher than it need be, or than the level of the ſtrand at low-water, that it is kept conſtantly filled with water; had that gentleman lived, doubtleſs he would not have permitted his property to be thus injured.

It

It muſt be the ſincere wiſh of every perſon, that an act of the Imperial parliament will be obtained to reclaim our commons from the ſtate of worſe than waſte; for, as Mr. Archer very juſtly ſays, they are not only receptacles for poverty and idleneſs, but when any thing is pilfered from the neighbouring farmers, it is always traced to the next commons. But it muſt be hoped alſo, that a comprehenſive act will prevent the expenſive and vexatious neceſſity of ſeparate acts for every little patch of common. If theſe commons were reclaimed (which they might eaſily be), and, after compenſation made to thoſe who are intereſted in them, the ſurplus was devoted to the eſtabliſhment of one or more experimental farms, or for premiums to improve agriculture, or any other purpoſe thought neceſſary; it would be a new and glorious æra in agriculture, that would at once be highly beneficial to the community in general, and even to the wretched beings, who ſubſiſt by plundering their neighbours; I am convinced there is not a farmer in the vicinity of commons, that would not wiſh to ſee them reclaimed, as, in their preſent ſtate, excluſive of the numberleſs thefts committed on them, they ſerve only to rot his ſheep, or ſtarve his young cattle.

SECT.

SECT. 21. *Poſſibility and means of improving them.*

IT is a melancholy reflection that, in the neighbourhood of an opulent city, not leſs than 34,000 acres of land remains an almoſt barren waſte, and yet only a very ſmall portion of this is beyond the reach of improvement; for we are given to underſtand, that marle or limeſtone-gravel are to be found in abundance in almoſt every direction; but the manure of all others, that preſents itſelf in every direction, is *water*, which, if made to flow over the ſurface, would, in a very ſhort time, at a very moderate expence, change the appearance of theſe dreary waſtes to a charming verdure, and give abundant meadows where they now, as Counſellor Caldbeck very juſtly remarks, "only ſerve to ſtarve a few young cattle and goats."

Planting is the next improvement, that requires attention. There is ſcarcely any part of theſe mountains, that could not be planted with great profit: the heath forms one of the greateſt advantages attending this ſituation, as it affords a ſhelter greatly wanting in theſe elevated ſituations. I mention this, becauſe heath, as well as furze and other underwood, are too often cut down, previous to planting, by injudicious planters.

Scarcely any thing could contribute more to the improvement of theſe mountains than good roads; I am perfectly

perfectly convinced that, if this was effected, improvement would make rapid advances. In the ſection on roads I have enlarged on this ſubject, as indeed a moſt neceſſary one.

Burning the ſurface, if covered with heath, and other uſeleſs and ſtrong growing plants, is a very neceſſary preparatory operation before the introduction of the plough; but I muſt caution improvers againſt ploughing deep for this purpoſe in *ſhallow moors*, as it is only neceſſary to get rid of plants, that would prevent coheſion in this moory ſoil, and that, from their aſtringent property, would with great difficulty be made to rot. If land of this deſcription is ſet in ſmall tenements, it will be neceſſary to prevent burning, unleſs for this purpoſe; and alſo to confine the tenants, *for their own ſakes*, to alternate green and corn crops. Indeed I conceive, that potatoes and green crops would be the moſt advantageous on theſe mountains, until alternate expoſure to the atmoſphere, and the *ſhade* cauſed by green crops, brings the ſoil to the ſtate neceſſary for the production of corn crops. The cultivation of potatoes, cabbages, turnips, borecole, &c. for cattle, would be uncommonly advantageous to the cultivators, as they poſſeſs at all times a ready means of diſpoſing of any redundancy, on good terms, in Dublin market.

It is almoſt needleſs to obſerve, that draining muſt precede all other improvements. The conſiderable declivities of theſe mountains, and great abundance of

ſtones almoſt every where to be met with, renders this a very eaſy operation; but much of this expence may be ſaved, by boring with an augre to let up the ſprings, or, in ſome few caſes, to let them down, according to the nature of the different ſtrata.* Many extenſive tracts of theſe mountains may be drained effectually in this manner, at a very trifling expence; but, to prevent diſappointment, it may be neceſſary to premiſe, that in many caſes boring will be of no uſe; I mention this, becauſe I am aware, that many imagine the augre is poſſeſſed of almoſt the power of Moſes's rod.

The immenſe quantity of bog, that is annually waſted for unneceſſary purpoſes, requires more attention than has been generally paid to it. I have mentioned this to ſeveral proprietors, but have either been laughed at, or anſwered very frequently, "there is more than will laſt an hundred years;" to an individual this is a long period; but to a nation, that has every reaſon to look forward to an encreaſe of population, or to a man, who regards his poſterity, a very ſhort one: but there are many bogs that, at the preſent rate of conſumption, without

* In viewing Collon about four years ago, I obſerved a very diſagreeable ſwamp near the entrance, which had been attempted to be drained in a very injudicious and expenſive manner. I deſired the perſon, who ſhewed me the improvements (Mr. Patterſon), to inform Mr. Foſter, that I imagined *one drain* and a few augre-holes would effectually drain it, and I pointed out to him the direction of the drain; but I underſtand it has remained ſince in the ſame ſtate, for the exerciſe of Mr. Elkington's abilities, who, I am informed, is engaged for this purpoſe.

without adverting to an encreaſed population, will not laſt perhaps fifty years, or the diſtance will become ſo great, as to raiſe the price very conſiderably. I am far from wiſhing to deprive the poor of one of the greateſt comforts of life; but the enormous waſte they and their children commit calls loudly for a timely attention.

SECT. 22. *Obſtacles to them, and the beſt means of removing them.*

THE obſtacles mentioned by Mr. Archer would no longer exiſt, if the cultivation of green winter food became general. We ſeldom hear of potatoes having been ſtolen, for they are no rarity; if every landholder beſtowed a very ſmall quantity of ſeeds, or a few thouſands of plants, in ſmall quantities, to their poorer neighbours, it would not only ſave their fields from pilfering, but they would have the ſatisfaction of contributing to the comforts of the poor, who would in a ſhort time become ſo attached to the cultivation of theſe plants, that, for their own ſakes, they would keep off all marauders, and it would alſo take away all pretext for pilfering: an ounce of cabbage-ſeed, value ſixpence, will produce upwards of a thouſand plants, and other ſeeds are proportionably cheaper. If a few trees were planted around every cottage, and ſtrict charge given for their preſervation at ſetting the tenement, the com-

plaint on this head would no longer have any foundation; and, except during the late diſturbed ſtate of the country, I cannot hear of any complaints worth noticing. I am well convinced, that a few young trees, cut down by unthinking boys, have in many inſtances been magnified into *plantations deſtroyed*, and a dozen or two of turnips have been alſo magnified into *whole fields carried away*, and by no means call for thoſe ſanguinary laws, that have been too often propoſed.

Much expectation has been formed, that Luke White, Eſq. will ſet an example on an eſtate he has lately purchaſed in theſe mountains; I underſtand the ſituation is peculiarly favourable for the improvements I have before ſuggeſted. When we add to this gentleman's opulence, the great taſte and ſpirit he has evinced at Luttrel's-town (now Woodlands), we have every reaſon to expect he will exert them on the improvement of this eſtate; and, at the ſame time that he is encreaſing his income, he will have the exquiſite pleaſure he muſt have often enjoyed, of contributing in the beſt manner to the ſupport of the numerous poor—*by giving them employment.*

Great part of the Hill of Howth comes under the deſcription of theſe mountains in every reſpect; the ſame courſe of improvement, with the addition of ſea-ſand and ſea-wrack, would ſoon make a great change in its appearance, as I underſtand it poſſeſſes every means of improvement enjoyed by the others. It is

hoped

hoped the preſent Earl of Howth will take advantage of the new lights, which ſcience has thrown on agricultural ſubjects; it will at once contribute to the encreaſe of his income, and to the amelioration of the condition of his tenantry.

It muſt be exceedingly gratifying to every lover of his country to be informed, that at length the great value of our bogs and other waſte lands is beginning to be known; I underſtand ſome companies for their improvement have been lately propoſed; and there cannot remain the ſhadow of a doubt that, if they are conducted with ſpirit and judgment, they muſt return a very ample intereſt for any ſum, however extenſive, much greater than can be obtained by any other mode of *honeſt* ſpeculation; but I muſt confeſs, from what fell from a gentleman very active in this buſineſs, I entertain very great doubts that *ſpirit* will be wanting; for, on his ſtating ſome of the probable expences, he mentioned the *enormous* ſum of *fifty pounds a year*, to be given to a perſon capable of conducting a buſineſs of this magnitude. If this idea actuates Waſte-land companies, I venture to predict they will experience nothing but diſappointment and loſs, and had better turn their money to ſome other purpoſe; an undertaking of this extenſive nature requires a knowledge very ſuperior to that requiſite to *keep labourers accounts*.

When the immenſe quantity of improveable ground in Ireland is adverted to, it will be thought aſtoniſhing, that

that any proprietor, with a guinea in his pocket, could keep it unemployed; yet there are numbers of men, poſſeſſing large ſums of money, for which they do not receive more than 5 per cent. intereſt, very often much leſs, that have *many thouſand acres* of land of this deſcription, which, I will venture to aſſert, would return from 10 to 50 per cent. per annum; but monied men are too apt to encreaſe their acres, inſtead of improving what they already poſſeſs. It may be neceſſary to obſerve, that money for improving lands of this nature *is not ſunk*, for the firſt crop very frequently pays more than *all the expences*.

I have been informed by a reſpectable farmer, that he has received upwards of thirty guineas for the produce of an acre of moory ground, which coſt him only about fifty ſhillings to reclaim.

SECT. 27. *Whether the County has been actually ſurveyed, &c.*

IT is not a little extraordinary, that no map of the county has been publiſhed for many years (I believe none ſince that publiſhed by Rocque in 1762); but we may expect ſhortly to ſee this very deſirable object accompliſhed, as the Grand jury have taken up the buſineſs; it is to be wiſhed, that it may be on a ſcale ſufficiently large to mark gentlemens' ſeats, and even

even every farm if poſſible, and all the bye-roads, as it would be a means of ſuggeſting many communications and improvements, that are greatly wanting. If Meſſrs. Sherrard and Braſſington could be prevailed on to undertake it, we ſhould have every reaſon to expect theſe hints would be obſerved, as their maps poſſeſs uncommon accuracy, and elegance of execution. If ſections of the ground, and the levels, are added to this map, they would make it ſtill more extenſively uſeful.*

SECT. 29. *The Weight or Meaſure, by which Grain, Flour, Potatoes, &c. are ſold.*

The Board of Agriculture in England have long wiſhed to equalize the weights and meaſures through the united kingdom, but as yet the Herculean labour has not been accompliſhed; it is not ſo eaſy a matter, as ſpeculative men in their ſtudies may think, to change old cuſtoms, as we have not only to learn a new leſſon, but, what is much more difficult, we have to forget the old; if this could be accompliſhed, it would be extremely deſirable, as ſcarcely any two counties uſe the ſame

* Since I wrote the above, I underſtand Mr. Sherrard has ſent propoſals to the Grand jury; alſo Mr. James Lynch, profeſſor of natural and experimental philoſophy to the Dublin Society, propoſes to undertake it; his profeſſional acquirements are long well known; and his lectures prove moſt unequivocally, that there could ſcarcely be found a perſon more capable of accompliſhing it with accuracy.

ſame weights and meaſures. How ridiculous is it that, in our own market, rough tallow is ſold at 15lb. to the ſtone, and wool 16lb. to the ſtone, and ſeven ſtone to the hundred; and, in many parts of Ireland, the barrel of potatoes is from 20 to upwards of 120 ſtone; without adverting very particularly to theſe differences, the Statiſtical Surveys will not convey that information, that the Dublin Society and the public ſo much wiſh for. If the legiſlature would take up the buſineſs with ſpirit, and give, ſuppoſe a year's notice, that, on a certain day, the weights and meaſures would be of a certain ſtandard, and theſe ſtandards previouſly diſperſed through every part of the united kingdom, every deſcription of people would have time to be prepared for this adoption; and a little perſeverance, and a forfeiture of the old meaſures after that day, would, in all probability, accompliſh this long wiſhed for meaſure.

IRRIGATION.

THIS improvement having at length received ſome attention from the landed proprietors of Ireland (but by no means what it deſerves), a few hints in aid of it will not, it is hoped, be deemed unſeaſonable or unuſeful. I did intend to have brought into one view all the paſſages in different authors illuſtrative of this ſubject, but it would not only extend this article beyond the

the neceſſary limits, but I find it much more ably executed by Mr. Tatham, in his Treatiſe on National Irrigation, lately publiſhed, and ſold by Mr. Archer in Dame-ſtreet, which I cannot too warmly recommend to the perufal of every landholder.

With ſome few exceptions, irrigation in Ireland is of very recent date; for the random efforts of ingenious and ſpirited individuals, conducted by handy labourers, can by no means be conſidered as *perfect irrigation*. Frequently we ſee ground partially watered, by letting in the ſtream at the higheſt part of the ground, and permitting it to run uncontrouled down the declivity;* conſequently, as no ground is an exact inclined plane, the water runs naturally into the hollows, and, if it can not eſcape, does much injury, beſides leaving every little eminence untouched by it. In ground, that has been watered in this defective manner, the brown colour of the graſs in ſpots eaſily ſhews it, whilſt the hollows are the moſt perfect green (if the water is not ſtagnant) all through the winter.

Many are poſſeſſed with an idea, that ground for this purpoſe muſt be perfectly flat, and that *all hollows* muſt be filled up; this is by no means neceſſary in ground, that has a conſiderable inclination, as *hollows only, that retain water like a diſh*, need be filled up. One

* Some gentlemen know ſo little of the ſubject, as to call this "watering," and ſay it can be executed for *a few ſhillings per acre!*

of the bad effects, attending this indiſcriminate levelling, would be, the laying bare, frequently, banks of very bad clay, gravel, or perhaps rocks. Where hollows muſt be filled, the ſods and earth from the levels and other parts of the work are very often more than ſufficient.

Raiſing a bank of earth for conducting the water, inſtead of cutting *into the ſod*, is another very uſual and erroneous method; by this means not only the level is loſt, and not near the quantity of ground watered that might have been, but the water is thrown back on the higher part of the ground, and much graſs deſtroyed, by the water remaining on it too long; it alſo occaſions a great waſte of ground, which the ſcythe cannot touch. I have ſeen this laſt method practiſed at his Grace the Duke of Leinſter's at Carton, whoſe demeſne poſſeſſes great capability for irrigation; for independent of the ſupply from the canal (which is not conducted over the twentieth part of the ground it might), I believe, from a tranſient view, a level might be taken from the Rye river, which would water a good portion of the demeſne; for it poſſibly may be in this, as in almoſt every place I have viewed; much more ground may be watered than the eye can direct.

I have ſeen many attempts at watering, by *lines* drawn *diagonally acroſs the declivity*; except the ſupply, no other part can be cut *by a line*, as the water is the only level, that

that can be relied on; and when I ſee different kinds of levels recommended by authors for this purpoſe, I muſt conclude they know little of *catch-work watering*, which is the kind I here allude to. I have ſeen ſome of this kind of watering near Rathcool, in the county of Dublin; it muſt have been badly conducted, or little underſtood, as the ſurface of the ground, when I ſaw it in December, inſtead of being a fine green colour, was quite brown; I imagine from this, and from ſome converſation with a neighbouring farmer, it could be only conſidered as the old practice of flooding, that is, permitting the water to ſtagnate long enough on the land to depoſit its ſediment.

However, all theſe defective methods ſtill prove the great benefit of irrigation, as they have all effected a great improvement, but *infinitely ſhort* of that to be obtained by a more ſcientific mode.

It is preſumed there are few countries in the world better adapted to irrigation than Ireland; for, let us turn our eyes where we will, rills of water are ſeen running down every hill; *there is ſcarcely a gentleman's demeſne in Ireland, that cannot in the whole or in part be watered*; and there are few farms in the vicinity of the metropolis, to which the proprietors are daily drawing dung at the expence of at leaſt twenty guineas an acre, that have not a ſufficiency of water for doing the whole, or at leaſt a part; there does not remain a doubt, that ground under this improvement *is in every reſpect*

ſuperior in produce, and can be generally made ſo at a fourth part of the expence, and kept in this productive ſtate *for ever*, for a few ſhillings per acre per annum.

Moſt of the writers on this ſubject have given directions for watering graſs-lands only; but it will be found that, when the practice and ineſtimable value of this ſpecies of improvement is better known, every kind of crop, both in fields, gardens, orchards, &c. will, if poſſible, receive more benefit than graſs-land.

Amongſt the many advantages attending this proceſs, it is not one of the leaſt, that no manure of any kind is wanting, which leaves the dunghill for manuring ground, that cannot be watered, and which, moſt probably but for this, would never have received any.

I have heard many exclaim againſt the expence, and ſome, who are daily drawing manure from Dublin, at an expence of at leaſt twenty guineas an acre, are of this number. Now let me aſk any of theſe *cautious* gentlemen, would they not jump at an offer to manure their ground highly for *five guineas an acre*, and *keep it ſo*, or rather improve it annually for a few ſhillings an acre? yet this is really the fact; for I have ſeen very few ſituations, that I would not undertake to irrigate in the moſt perfect manner for this ſum, finding every material, and in many places for much leſs. As the ſtrongeſt proof, that I would do it on theſe terms, I offered to irrigate as much of Marly as could be accompliſhed (indeed nearly the whole demeſne could be done),

done), for five guineas an acre, beſides thinning the plantations, or otherwiſe improving or ornamenting the demeſne, without any *additional* charge.

Flooding land, by permitting the water to ſtagnate and depoſit its ſediment, has been long practiſed, and, where the water can be brought under any controul, effects a great improvement; yet the value and management is very inferior to irrigation, where the water can be brought quickly on and off at pleaſure.

Mr. Young, in his moſt uſeful Annals of Agriculture, Vol. 20, page 360, in very ſtrong language endeavours to turn the minds of Iriſh landholders to irrigation; yet ſuch was the ignorance or careleſſneſs of thoſe, to whom it was addreſſed, that ſcarcely any notice has been taken of it, although many years have elapſed, ſince it was firſt publiſhed. One would have naturally expected that, when Mr. Young had ſo very plainly pointed out the very great advantages and eaſineſs of the practice, it would have circulated like wildfire; and that every *landlord*, with his paper in his hand, would have been conſtantly amongſt his tenantry, pointing out the proper ſituations, and endeavouring to teach them the beſt method; but ſo far from this being the caſe, they did not make any attempt, even on their own demeſnes. Where Mr. Young's voice failed, I have little hopes my feeble one will be heard.

I have frequently, with the greateſt regret, obſerved the fineſt ſituations for this improvement totally neglected;

glected; ſituations that, in their preſent wretched ſtate, are not worth ſixpence per acre, yet might at a very moderate expence be raiſed to the yearly value of from *two to five pounds* an acre. Poſſibly it may aſtoniſh thoſe, who have not turned their thoughts to this ſubject, to be informed that I conſider the Fews mountains, between Dundalk and Armagh, and the mountains near Dungiven, in the county of Derry, to be of this deſcription; yet there does not remain a doubt on my mind, that the greater part could be made as productive as the above ſtatement at a moderate expence. Mr. Frazer, in his very admirable Statiſtical Survey of the County of Wicklow, ſupports my aſſertion very ſtrongly, by pointing out the capability of ground, at leaſt to appearance equally unpromiſing as the mountains, which I have ſelected for this purpoſe, becauſe they are uſually mentioned as *totally irreclaimable*, and condemned to remain for ever a *dreary waſte*.

To the account of the irrigation I conducted for the Right Hon. David Latouche at Marly (page 270, of the Statiſtical Survey), it may be neceſſary to add, that part of the expence ſtated by Mr. Archer (about five guineas an acre), for making the watered meadows, was cauſed by the neceſſity of filling up the cuts, that had been formerly made in the moſt unſcientific manner; and alſo, that the expence was greatly encreaſed by being obliged to bring the water a conſiderable diſtance through Captain Southwell's demeſne; for this reaſon

reaſon it was neceſſary to uſe a *ſtone and brick ſhore, covered with mountain flags*; if this could have been carried in the uſual manner, in an open drain, a much leſs ſum would have been neceſſary; and as I made no additional charge for thinning the plantations, it made the acreable expence ſtill leſs, as certainly ſomething ſhould be deducted on that account. Mr. Archer might have extended the quantity of ground capable of this improvement; for I imagine upwards of 150 to 200 acres could be covered, as water from other ſources might be obtained; even the water at preſent uſed could be extended to nearly the quantity I have mentioned; in ſhort this demeſne poſſeſſes more capability for this improvement, than any other of the ſame extent in this county; and as the grounds capable of being watered lie moſtly in view of the manſion-houſe, they will be at all ſeaſons, from their fine green colour, a moſt charming object, and infinitely the moſt profitable part of the demeſne of Marly, as the firſt expence is the only one, and, contrary to all other manures, time, inſtead of diminiſhing, will encreaſe their value.

HORTICULTURE.

Mr. Grierſon has great merit in his attempt to introduce the plough into the garden, inſtead of the ſpade. Contrary to the general opinion, I agree with Mr.

Mr. Archer, that the ploughing more effectually and eaſily ſubverts and pulveriſes the ſoil, than the uſual mode of digging. If ground is dug by the perch, the labourers turn it up in large lumps, and will not ſtop to break it properly, by which means, when it is planted, it ſinks unequally, and the roots of trees or plants are injured by the admiſſion of drying winds, froſt, &c.; if they dig it by the day, it is probable they will not do half as much as they ought. It is not eaſy to account for the neglect of this method by kitchen-gardeners; they always complain, and juſtly, of the great expence of labour; and as few are without horſes for the purpoſe of drawing the produce of their gardens to market, or bringing home dung, they could very eaſily accompliſh it, particularly as their ground, from large quantities of manure, and frequent cultivation, is always in ſo friable a ſtate, that two horſes, and often one, would be fully ſufficient; and by ſowing and landing with the plough, their advantages would be ſtill encreaſed.

I am well convinced, that if a perſon or company, with a good capital and competent ſkill, would take a large farm on the banks of either of the canals, and practiſe the above method with ſpirit, and on an *extenſive ſcale*, a very handſome fortune might be made, as to the uſual routine of the kitchen-garden might be added the ſaving of ſeeds, cultivation of green lucerne, ſainfoin, vetches, clover, &c. for Dublin market, early

potatoes,

potatoes, fruit, and a long etcetera, which experience and taſte would add to the catalogue. If we reflect for an inſtant on the ignorance, ſmall capital, and trifling quantity of ground occupied in this branch of buſineſs in general, and, at the ſame time, take into the account the ſupport of very often a large family, and too often the large ſums expended in whiſkey and porter, very little argument is neceſſary to convince us, that I am not too ſanguine in my propoſal. I by no means intend this as a general ſtigma on kitchen-gardeners; many may be very juſtly ranked amongſt the moſt induſtrious, ſober, and hard-working claſſes of the community; but I fear the reverſe of the picture is too often as I have drawn it.

Burning Plants for Aſhes.

This is a branch of rural economy, that has had but little attention paid to it; yet that it is a matter of ſome moment may be concluded, from the great amount of foreign aſhes imported in the laſt ſeven years, upwards of 810,250 cwt. What has been obtained in this country is generally from weeds of all ſorts indiſcriminately, and too often mixed with clay and other ſubſtances. I am informed, that the aſhes produced from wormwood are ſuperior to thoſe from any other kind of plant; as it thrives in very ſandy ſoils, it might

become a very valuable article in ſituations near the ſea-ſhore. From ſome ſmall trials I have made ſome years ſince, I am very much inclined to think, that an acre of the beſt ground would pay as much for this purpoſe, as under a crop of corn; beſides, it is an occupation for women and children, and would not interfere with the harveſt.

Saving Seeds.

As prejudices are wearing away faſt, that, which has been ſo long entertained againſt the poſſibility of ſaving ſeeds in Ireland, will, it is to be hoped, not be one of the laſt. From many trials made by many perſons, and from thoſe I have for many years made, I am perſuaded there are very few kinds we could not ſave in this country, with the ſuperior advantage, that we could, by viewing them in a growing ſtate, be certain that they were true in their kinds, and that no other variety of the ſame ſpecies were permitted to flower near them; a want of this very neceſſary caution has tended to bring ſeeds ſaved in Ireland into diſrepute; and I am convinced, where they have failed, it has more frequently been from careleſſneſs, than from the moiſtneſs of our climate. As ſome corroboration of this, there are now at the Dublin Society's Repoſitory, in Hawkins's-ſtreet, ſamples of red clover, ſaved laſt ſeaſon by Valentine Flood and Andrew Maguire near Swords;

Swords; and I have other ſamples equally good, ſaved by Charles Mulvaney and Henry Brien at Liſpopel in Fingal, which I think are nearly as good as the very beſt imported ſeeds. Theſe men have been for ſome years in the habit of ſaving clover-ſeeds, and, as they are very ſmall farmers, deſerve every encouragement; they are no ſmall reproach to ſome great farmers in their neighbourhood, who buy clover-ſeed from theſe very men.

	A.	R.	P.	
In 1800, Charles Mulvaney had on	1	0	2 - 8	*cwt.*
1801, - - - - - - - - -	1	3	10 - 6	*cwt.*
1800, Henry Brien had on - -	2	0	9 - 9½	*cwt.*

This, at the preſent price of good ſeed (ſix guineas per cwt.), leaves an uncommonly great profit, and helps to throw a ſtrong light on the heavy loſs ſuſtained by the following ſyſtem.

AN

EXTRACT

FROM

THOUGHTS AND DETAILS ON SCARCITY.

BY THE LATE RIGHT. HON. EDMUND BURKE.

I INSERT the following extract, as I think it will be an admirable leſſon to ſome of my fellow-citizens, and may be a means of preventing, in future, a repetition of thoſe monſtrous ſtretches of power we have ſeen exerciſed over farmers bringing their goods to market.

" The cry of the people in cities and towns, though unfortunately (from a fear of their multitude and combination) the moſt regarded, ought in *fact* to be the *leaſt* attended to upon this ſubject; for citizens are in a ſtate of utter ignorance of the means by which they are to be fed; and they contribute little or nothing, except in an infinitely circuitous manner, to their own maintenance; they are truly "*fruges conſumere nati*;" they are to be heard with great reſpect and attention upon

upon matters within their province, that is, on trades and manufactures; but on any thing, that relates to agriculture, they are to be liſtened to with the ſame *reverence*, which we pay to the dogmas of other ignorant and preſumptuous men. If any one were to tell *them*, that they were to give in an account of all the ſtock in their ſhops; that attempts would be made to limit their profits, or raiſe the price of the labouring manufacturers upon them; or recommend to government, out of a capital from the public revenues, to ſet up a ſhop of the ſame commodities, in order to rival them, and keep them to reaſonable dealing; they would very ſoon ſee the *impudence*, *injuſtice*, and *oppreſſion* of ſuch a meaſure; they would not be miſtaken. But they are of opinion, that agriculture is to be ſubject to other laws, and governed by other principles. A greater and more ruinous miſtake cannot be fallen into, than that the trades of agriculture and grazing can be conducted upon any other than the common principle of commerce; namely, that the producer ſhould be permitted, and even expected, to look to all poſſible profit, which without fraud or violence he can make; to turn plenty or ſcarcity to the beſt advantage he can; to keep back or bring forward his commodity at his pleaſure; to account to no one for his ſtock or for his gain. On any other terms, he is the ſlave of the conſumer; and that he ſhould be ſo, is of no benefit to the conſumer. No ſlave was ever ſo beneficial to the maſter,

maſter, as a freeman, that deals with him on an equal footing, by convention, formed on the rules and principles of contending intereſts and comprized advantages. The conſumer, if he were ſuffered, would in the end always be the dupe of his own tyranny and injuſtice. *The landed gentleman is never to forget, that the farmer is his repreſentative.*"

APPENDIX.

APPENDIX.

EXTRACTS

FROM

DOCTOR John RUTTY'S ESSAY

TOWARDS A

NATURAL HISTORY

OF

THE COUNTY OF DUBLIN,

PRINTED IN THE YEAR 1772.

EXTRACTS

FROM

DOCTOR RUTTY'S ESSAY,

&c. &c. &c.

SECT. I. *Of Marle.*

THE word Marle was formerly uſed in a very vague ſenſe, and of conſequence it muſt ſometimes happen, that what was affirmed of one ſpecies of it did not hold in another.

I ſhall therefore here adopt the definition of marle given us by the two beſt late writers on foſſils, viz. Hill, and Emanuel Mendez de Coſta, viz.

"Earths are but ſlightly coherent, not ductile, ſtiff or viſcid while moiſt, moſt eaſily diffuſible in and diſunited by water, and by it reduced to a ſoft, looſe, incoherent maſs.

Walerius indeed and ſome others add, as a characteriſtic of marle, that it makes an effervescence with acids; but both the above-named authors agree in

ranking many earths under the denomination of marles, which make no effervescence with aqua-fortis; *v. g.* the *Marga columbina Plinii*, being a stony bluish marle of Hill, so long celebrated as a manure, makes no ebullition with acids, as neither do several of the red marles of the same authors, nor several green and black marles mentioned by Hill, nor two of the blue sort mentioned by De Costa, and yet several of these are found to make excellent manures for clayey stiff soils, and the leaner ploughed lands.

I have not yet met with any marles in this neighbourhood, which do not make an ebullition with acids: for, though the county of Dublin affords great plenty, and a considerable variety of this useful manure; as the white and chalky, which whiten the hands, and acquire the taste of lime by calcination; the grey, the blue, the yellowish, the reddish, the brown, and the black, and some shelly, some stony and slaty, yet all these effervesce with acids, and no wonder, since our soil abounds with limestone and calcareous earth; and the differently coloured marles above-mentioned for the most part are no more than the calcareous earth, combined with a little mineral oil, clay, and sometimes a little ochre or iron.

Markham condemns the use of marle in general on a stiff, wet, cold clay: nevertheless, by its swelling and bursting in water, it shews a fitness to loosen a soil too stiff and adhesive; and so it has by experience been found

found to mend a clayey ſoil; yet on the other hand it has been obſerved to ſtiffen a too light and ſandy ſoil, and the ſandy loam; for as it has a certain degree of coheſion, it brings ground, that has leſs than itſelf, to a due degree of conſiſtence; and I have ſeen the good effects of the blue marle on a ſharp, gravelly, mountainous ſoil.

Thus far the operation of marle may be illuſtrated upon mechanical principles; but moreover, it is ſaid to be alſo uſeful in all ſorts of ſoils, commonly meliorating the earth, making barren lands fruitful, and increaſing the crops of corn fourfold, and cauſing it to produce trefoil inſtead of quichgraſs or dyer's weed, and wheat inſtead of rye.

It will, however, be worth while to conſider the ſeveral ſpecies of marle, as a further means of illuſtrating and diſtinguiſhing its operations.

Some have made three diviſions of it, viz. 1. The ſhelly. 2. The ſtiff or clayey. 3. The ſlaty; to which I muſt beg leave to add a fourth, viz. the ſandy marle, being frequent in this county, and therefore I ſhall ſubjoin a particular account of it.

1. The ſhelly marle improves clayey grounds, which the ſtiff ſort does not. It is alſo ſooner ameliorated by the air, and therefore it produces as good a crop the firſt year after it has been laid on, as it does in any of the ſubſequent.

2. The

2. The clayey or ſtiffer marle improves a ſandy ſoil, and agrees to clay in producing fertility ſlowly, not having its effect generally till the third year, though quicker than clay, but leſs laſting.

2. Slate marle, which is ſtill more ſlow in its operation than the clayey ſort, ſpending more ſlowly, but laſts longer, and looſens the ſtiffeſt clay.

To this claſs may be referred that, which is called *rotten limeſtone*, being proper for manure, and not for building, and is a marle, according to Hill, falling off in ſcales gradually year after year.

Akin to theſe ſeems to be the rock-marle, of which ſee an account hereafter among the mineral petrifications.

4. Sandy marle. This is either peculiar to us, or at leaſt far more frequent than in England. It is here commonly called limeſtone-ſand, but more properly *ſandy marle*, having commonly ſome ſmall degree of tenacity, and agrees to the *marga arenacea* of Cæſalphinus de Metallicis, and to the *marga arenoſa lutea friabilis* of De Coſta, with this difference, that I found none in this county but what effervesces with acids; and ours varies in its colour, having, from ſlight extraneous mixture, been found ſometimes browniſh, blue, and black.

There are frequent pits and quarries of this ſand, or rather marle, and often accompanied with what is called limeſtone-gravel in this county, *v. g.* near Rathfarnham

farnham bridge, near Tallow, at Green-hills, at Monk's-town, at Kilmaſheoge, at Hunt's-town, near Roger's-town, at Glaſamucky, Coliagh's-town, and Bornabriny.

In all experiments it proves an excellent manure in clayey ſoils, mellowing the ſtiff clay, advancing the rent of the lands, by producing clover where quich-graſs grew before, and yielding good crops of bere, barley, and wheat.

I made an analyſis of it by an eaſy proceſs, thus: Water poured on it, and ſhook up, exhibited three different ſubſtances. 1. Of ſand properly ſo called, as a kind of gem, being untouched by acids. 2. Of an unctuous ſubſtance. 3. Of a calcareous ſand, which effervesces with and is diſſolved by aqua-fortis; though of this, in one ſpecimen, there was not quite one-third of the whole.

A ſingular ſpecies of this marle may perhaps merit a particular account, viz. At St. Marnock's old church, near Carrick-hill, is a black ſand, conſiſting of a fine black mould incorporated with ſand, which has proved an excellent manure in the neighbouring clayey ſoil, increaſing greatly the crops of wheat, and uſed with great ſucceſs by B. Hoffsleger in his flower-garden at Feltrim. It ſparkled a little on the red-hot iron, and excited a conſiderable ebullition with aqua-fortis. The ſand ſeparated from the earth effervesced conſiderably with aqua-fortis, ſo that the ſand contains ſome calcareous matter, but the earth ſeparated from the ſand is quiet with nitrous acid.

Thus

Thus it abundantly appears, that this foſſil is not to be conſidered only mechanically as a manure, viz. as a ſharp matter proper to correct and divide a tough clay, but as ſuch a ſharp matter combined with an *unctuous ſubſtance* and a *calcareous earth*.*

Agaric mineral is another foſſil, of which I ſhall here annex ſome account, as being by ſome of our beſt writers reduced to the claſs of marles. It ſeems to be no more than a plain calcareous earth, though its whiteneſs ſeems to indicate it to be one of the pureſt.

It is very frequent in this county; *v. g.* at the Greenhills are ſtreaks of it as white as milk, running acroſs the gravel pits, and lining ſome of the cavities in the banks; and at a quarry near Lucan, the grey building ſtone was covered with it; and at a quarry near Oxmantown-green, at the depth of two and five feet from the ſurface, were ſtreaks of it, of a thickneſs of $\frac{1}{4}$ to $\frac{1}{2}$ an inch, moſtly running parallel to the horizon, ſometimes interſecting each other at right angles; and in ſeveral other different parts of the county, in pits of limeſtone-gravel.

It makes a ſtrong ebullition not only with the mineral acids, aqua-fortis, and ſpirit of vitriol, but even with vinegar, and ſtronger than limeſtone-gravel did upon the compariſon. It ſcours braſs and ſilver very well.

SECT.

* In the *Edinburgh Eſſays, phyſical and literary*, publiſhed in 1771, in which the clay-marle, the ſhell-marle, and the ſtone-marle are minutely examined and analyſed, none of them appear to contain above four-fifths of calcareous earth; the reſt is clay and ſand, and ſometimes iron, in different proportions.

SECT. 2. *Of Sand, and its Varieties and Uſes in Agriculture, and for Mechanical Purpoſes, &c.*

THIS city abounds with ſhells, from our great uſe of ſhell-fiſh.

Shells are an excellent manure, even unburnt, in boggy, heathy, wet, clay, or ſtiff land, eſpecially where the ſurface is turf, but not in ſandy ground. They ſeem to give the land a ſort of ferment, as barm doth to bread, opening and looſening the clods, and by that means making way for the roots to penetrate, and the moiſture to enter into the fibres of the roots.

This manure continues very long; the ſhells mouldering a little every year until they be ſpent, and wearing down more ſlowly, laſt longer than lime.

Now as ſand is frequently found mixed with ſhells, and particularly ſea-ſand, a very uſeful manure is ſupplied from it, *v. g.* the ſand from Howth, which has a mixture of ſhells in it, and effervesces with ſpirit of vitriol, and whitens water more than Wicklow ſand, as does alſo the ſand of the Dodder near Templeoge, and the ſand at Booterſtown, having minute fragments of ſhells in it; and near Skerries, where it is uſed for a manure, I found it full of broken ſhells, and, when dry, it made a ſtrong ebullition with ſpirit of vitriol; and it is found to be an excellent manure on rye-land,

or that which is called ſour, cold, barren clay, which bears ſorrel and heath, and no oats, which by this manure is ſo far meliorated as to bear wheat and barley, and the rent hereby is advanced from 2*s.* 6*d.* to 12 or 14*s.* per acre.

Moreover, the ſea-ſand is found alſo to improve even ſome of the ſandy ſoils, viz. by bringing a better ſand to a worſe.

Of Sea-Sand as a Manure.

It is but of late years introduced here as a manure, on the coaſt near Ruſh, Skerries, Balruddery, and Gormanſtown, where it is greatly uſed, and experienced to be better than marle in their clayey, ſtiff ſoils, and a particular excellency of it is known to gardeners and floriſts in killing grubs.

Now, as the good effects of ſea-ſand are evidently owing to the ingredients compoſing it, viz. 1ſt, to the ſand ſtrictly ſo called; 2dly, to the ſalt of the ſea combined with it; 3dly, to the ſhells, and ſometimes to the fragments of limeſtone or ſpar mixed with it.

Nevertheleſs it is to be noted, that ſand is alſo to be admitted as a manure, without either ſalt, ſhells, or any calcareous or ſparry mixture. For, near Garriſtown is a yellow ſand, having alſo ſhining or micaceous particles interſperſed, and which does not efferveſce with ſpirit of vitriol, and conſequently has no mixture of

of either ſhells or any calcareous matter, as neither has it of ſalt, but ſome mixture of iron, as appearing by its reddening, and in ſome parts yielding to the magnet on calcination.

Now this ſand, thrown on their lands in that neighbourhood, has improved their rye-land (i. e. ſpewy, moiſt, and clayey ſoil) to wheat-land. The reader may ſee this confirmed in Smith's Hiſtory of the County of Cork, p. 385, by the like good effects of a yellowiſh ſaburra or grit, and a ſand of the like kind as a manure in ſtiff ſoils.

We have other ſands ſpecifically different from this, *v. g.*

1. That which is called the white freeſtone-ſand, from the mountains near Ballynaſcorney, which is brought to Dublin to ſtrew on the floors in gentlemens houſes, being white and ſhining, and not imbibing the moiſture of the air like ſea-ſand.

2. A white ſand of an impalpable grit, and withal ſhining, as from what we call fire-ſtone, more thoroughly rotten, or moſt minutely pulverized. It ſcoured braſs and ſilver well. It was found in a bank near the breaks of Glaſſamucky, and with us ſhould be called fireſtone-ſand, but, technically ſpeaking, it is the *arena micacea* of Hill, or ſand, properly ſo called, intermixed with the *mica*.

3. Near a-kin to this is what we here commonly call freeſtone, or rotten fire-ſtone, being another of the mountain commodities brought to Dublin for cleanſing and whitening wood. It differs from the Engliſh

freeſtone,* which is a *lapis arenarius*, though the duſt of this laſt has the ſame effect in ſcouring boards and wooden veſſels as our rotten fire-ſtone above mentioned.

Several ſpecimens of this foſſil occur, and it is uſed for the ſame purpoſe, but differs from ſeveral of the *ſaxa arenaria* in De Coſta's hiſtory, being not calcinable, nor cauſing any efferveſcence with acids, as at the bottom of the mountains near King's-town and Titnock, on the road going from Bell-alley to Milltown, and near Kilmaſheoge hill. Some of theſe whitened the fingers; and in a cave on the ſhore S. E. from Dalkey, and at the breaks of Glaſſamucky, and at Glancullen, and ſeveral places in that neighbourhood; but particularly, on the lands of the Man of War is an excellent ſort of this our freeſtone, and in great quantity. It is ſandy, but of a finer grain than the common, has a tincture of yellow, does not efferveſce with acids, when freſh dug is ſomewhat unctuous, and uſed with lime for coarſe plaiſtering; but its chief uſe is for ſcouring boards with warm water; it takes greaſe out of them better than ſoap, and leaves them poliſhed.

4. Next, that for the uſe of the founder deſerves mention, as requiring a particular conſtitution, *v g.* the *arena craſſior, lutea hebes*, p. 557, 558, of Hill's Hiſtory of

* I met with one inſtance of a freeſtone like the Portland-ſtone, and which was truly a *ſaxum arenarium flaveſcens*, being found in a wall, and probably ſupplied from a neighbouring quarry at Milltown.

of Foſſils, which leaves a little yellow muddineſs in water, and is proper for caſting ſheet-lead; "for coarſer would make the ſurface of the ſheet-lead too rough and unequal, and a finer would be diſcompoſed and driven into heaps before the running maſs." *

Of this ſand ſeveral ſpecimens were found in this county, as at Milltown being ſmooth, and having ſome degree of a cementing quality; another from Lazer's-hill, which laſt and the firſt are ſaid to be advantageouſly mixed for this purpoſe, one being more, the other leſs binding; and at Knockmaroon is a little pit of it, and in the deer-park near Dublin, and on the banks of the Dodder near Rathfarnham bridge.

I am moreover informed of another important uſe of the ſand called founder's ſand, viz. that it vitrifies the lead, by which means it makes a fine paſte for glazing earthen-ware, being mixed in the proportion of one part of this ſand to two of calcined lead, and thus it gives a reddiſh caſt, and leſſens the expence, by rendering a leſs quantity of lead neceſſary.

Sect. 3. *Of Clay.*

Clay ſimply is alſo applicable as a manure to ſharp, ſandy, or gravelly ſoils, eſpecially the yellow and white clay; and where other manures are ſcarce, it is burned in kilns for this purpoſe, a ſpecies of huſbandry practiſed

* *Hill.*

tiſed in the county of Cork. Brick-clay will anſwer the purpoſe; it muſt not be burned too much, but be reduced to a reddiſh powder.

Potters' earth alſo in ſandy ground, and ſuch as does not hold water, binds and ſtiffens it.

At Ruſh and near it, where they have no dung (having no cattle), they apply ſea-ſand to their clay, and to their ſand add ſtraw cut ſmall and ſea-weed rotted together: and at Rogan's-town for the ſame reaſon, viz. on account of their having no dung, they uſe for manure ſtraw ſteeped and rotted in water. But to return to clay, its mechanical uſes next deſerve conſideration:

1ſt. For making bricks. The bricks manufactured here are generally bad, being far inferior to the Engliſh, which are redder, more compact and durable, whereas many of the preſent buildings made of ours muſt neceſſarily ſoon tumble down; for our brick-clay, as well as ſome of our potters'-clay, has frequently a mixture of calcareous earth, called lime-waſh, which after burning ſlackens on moiſture, and ſpoils the manufacture; and another reaſon for the badneſs of our bricks is, their being wrought up too haſtily, or not ſuffered to lie long enough to grow cloſe, as they do on being kept.

This matter is now happily explained by the diligent reſearches of modern naturaliſts, particularly thoſe of Woodward and Emanuel de Coſta, who obſerve, that the brick-clays in England are always dug up and expoſed

poſed to the air nine months before they are uſed, by reaſon that the pyrites being found in great quantities in them, eſpecially thoſe of Surry, Kent, and Middleſex, the ſaid clays are ever full of the vitriolic ſalts of that mineral, which they drain or clear from them by expoſing them to the air and weather, that the bricks may be more firm and durable; otherwiſe, if the ſalts were not drawn forth before the clay was baked, they hinder its ſetting in well in the kiln, and are apt to liquate afterwards, and ſo make the bricks and tiles moulder and decay; ſo that the neglect of a proper attention to this is one cauſe of the badneſs of our bricks, as their mixture with calcareous earth is another.

Another ſubdiviſion of clay, diſtinct from the former, is that, which ſerves for the uſe of the potter and tile-maker, which having leſs ſand than the brick-clay, and being tougher, bends more eaſily to any ſhape, as in making pantiles.

A. D. 1745. The Baldoyle clay for this uſe was but of a few years diſcovery, our potters' clay having been ſupplied from Merrion and Clontarf; and the clay of Merrion and Baldoyle have been mixed for making pitchers, and the compoſition was reckoned an advantage.

There is a good manufacture of this clay at Mullynahack, in Dublin, viz. of excellent black crocks, pantiles, ridge-tiles, flooring tiles, flower-pots, ſugar-moulds and drip-pots for ſugar-bakers.

Clay

Clay for pantiles was formerly got at Caſtle-kelly and at Old Bawne.

The imperfection of our pots made of theſe clays, however, compared to the Engliſh, is acknowledged: ours indeed, if properly ſeaſoned, and brought gradually to the fire, will boil water well, but do not bear the naked fire, though, according to my informers, there is no doubt but our pots might be made as good as the Engliſh, if more encouragement were given them, which is the more neceſſary by reaſon of the dearneſs of coals here and of lead, an article eſſential to vitrification; the quantity of which they are ſtinted in by reaſon of its price.

Limeſtone-gravel.

THERE yet remains an article among our manures, which demands a particular conſideration, viz. limeſtone-gravel. It conſiſts of maſſes of ſtones, pebbles, and ſometimes ſlate and ragſtone cemented or conglutinated together as by mortar. It deſerves a particular conſideration, as it abounds with us, and particularly in this county, even in all parts of it, *v. g.* at the Greenhills near Dublin, where ſome of the roads are like terras-walks by means of this gravel, whoſe excellency is in its binding, cementing quality, and at or near Newcaſtle is ſaid to be one of the moſt binding gravels in

in the kingdom; and at Dunleary are large rocks of it. It hardens in the air like the *ſtreccilla*.

In the Complete Body of Huſbandry, lately publiſhed, mention is made of a marley loam mixed with pebbles, ſupplying gravel to walks, and uſeful as a manure in clayey ſoils, which comes near to my preſent account of our limeſtone-gravel, which, as I am informed, is found in Derbyſhire, and ſome of the northern neighbouring counties, but very rare in other parts of England, inſomuch that their gravel has ſo little of the cementing quality, that they are frequently obliged to mix loam with it.

Our limeſtone-gravel always makes an ebullition with acids. The firſt ſpecimen I got of this gravel in this county had a fine, thin, white, ſaline cruſt on it; to obtain which it is neceſſary that it be laid out to be expoſed to the air, elſe it fails in its good effects;* for beſide

* Dr. Ainſlie, author of the article on marle, in the *Edinburgh Eſſays, phyſical and literary*, publiſhed in 1771, oppoſes the vulgar notion of aſcribing the fertilizing quality of marle to the nitrous ſalt formed by its attraction of an acid from the air; and indeed to aſcribe this principle hereunto, were attributing too much to it; as, on the contrary, the excluding it from any ſhare herein were attributing too little to it.

Certain it is that ſaline efflorescences, even by the author's own teſtimony, are found upon marle, and, by my own obſervation, upon limeſtone-gravel: now rain-water or dew, paſſing over theſe will become ſaturated with their ſolution, and thereby be improved in their fertilizing quality.

Modern experiments have determined, that plants grow and bloſſom in meer rain water, and that, when ſet in earth, this laſt loſes nothing of its weight upon the plants having grown

beſide the uſe of it on account of its binding quality in gravel-walks in gardens and in the high-roads, it is alſo of great and important uſe as a manure; and this appears to have been an ancient practice revived to a very good purpoſe of late; for near Glaſſamucky are the remains of old pits, that have been formerly dug for it.

Its uſe as a manure, is chiefly in the ſtiff clayey ſoils: it has indeed in the too looſe, ſandy, and gravelly ſoils, alſo ſucceeded better than dung; but it is more eminent for improving mountainous, boggy, and clayey ground, and wet bottoms, the water being previouſly drained from them, and proves a better and more laſting manure than marle, mellows the ſtiff clay, correcting the tenacity of the clay, meliorating the juices of the earth, and producing the white and purple trefoil, where ſour graſs grew before, and excellent corn, and doubling the crop. So in the mountainous, boggy, and clayey ground near Rathcool, the lower part of their mountains, by means of this manure, bears barley, wheat, and peas, which elſe would not grow here, requiring a richer land, and ſo by means hereof their rye land is turned to wheat land: but that it may anſwer theſe good

to perfection, the rain-water being not a meer vehicle, but furniſhing matter for the growth of vegetables, ſupplying them with the calcareous nitre, and abſorbent earth, and a phlogiſtic or oily matter; and as dew in all experiments affords a greater quantity of ſolid contents than rain-water, its ſuperior fertilizing quality is hence accounted for; and this will be ſtill further improved by the additional impregnation of the aerial nitre.

good purpoſes, it muſt be ploughed in with the fallow, and with it expoſed to the ſummer ſun; for if it be not laid out ſo as to have the benefit of the air, it fails in its good effects. For a further account of the operation of the air in promoting vegetation, I refer to *Home's Principles of Agriculture and Vegetation*, printed in Dublin, 1759.

Of the Gypſum.

It is mentioned here becauſe it is ſold in Dublin, being brought from Mullikartan near Liſburn, where it is found in great quantities.

It runs in long white ſtriæ parallel to each other; it makes excellent plaiſter, bubbling and boiling up in the pot over the fire, as the plaiſter of Paris, and accordingly is uſed in ſtucco-work, in which it is found to be excellent, and even ſuperior to that, which comes from France, being not liable to crack as that, and gives a cement much more durable under water, as George Sempill, architect, aſſured me.

It has been ſold by our druggiſts for ſcouring ſilver.*

* There is alſo a reddiſh ſort beyond Carrickfergus, and ſome of it has a bluiſh caſt.

SECT. 4. *Of Rotten Stones, with an Analyſis of them.*

As the preceding article, viz. gypſum, has been of uſe in ſcouring of metals, it will be no unnatural tranſition to conſider next the ſtones called rotten ſtones, the *terra cariosa* of Woodward, the uſe of which ſtones is to poliſh braſs, iron, copper, ſilver, wood, and ſtones, after the uſe of other rougher materials, as the emery and the ſkin of the dog-fiſh; and ſometimes they are previouſly burat for this uſe to advantage.

The Engliſh has hitherto been preferred for thoſe uſes, eſpecially ſcouring of ſilver, to any yet found in Ireland; but from the following obſervations it appears, that we may not only be ſupplied with this article at home, but even that it may be exported to advantage.

We have a great number and variety of theſe ſtones in this county, and of different colours, as pale brown, dark brown with red ſtreaks, ſnuff-coloured, yellow, and black, *v. g.* the *Tripela fuſca levis, Light brown Tripoli* of Hill, near Kilmaſheoge, very frequent there, and which has been exported to London in great quantities to advantage. Others by the river ſide from Rathfarnham to Old Bawne, on the road from the deer-park to Caſtleknock, in a quarry at Ormantown-green, at Cloghran, on the ſhore near Baldoyle and Malahide,

Malahide, and many other places, and particularly in the bay of the lower Corballis, which is much expoſed to the N. W. winds.

I confeſs the above account of our rotten ſtones is different not only from thoſe of Hill, but likewiſe ſeems to contradict the ſentiment of Cronſtedt in his late ſyſtem of mineralogy, who deems the Tripoli to be a mouldered ſiliceous earth: however, the experiments I made on ours are faithfully related, and may ſerve to eſtabliſh a variety in the ſtones paſſing under this denomination.

Of the Lapis Hibernicus.

There is yet another ſpecies of rotten ſtone, the conſideration of which will properly ſucceed that beforementioned, but of a very different nature, although the corroſion of both may be owing to the ſame general cauſe. The action of the atmoſphere by ſulphur and ferruginous matter forms the martial vitriol: of which laſt ſpecies of rotten ſtone is our celebrated Iriſh ſlate, being a kind of decompoſed or mouldered pyrites.

I met with a ſpecimen of this on the ſouth ſide of Carlſtown, and on the road to the ſpa, which is there. Having been expoſed ſome months in my cloſet, it was infuſed in water, which infuſion gave a purple tincture with galls; and after being kept in a bag nine months, it

it exhibited a white efflorescence of a strong vitriolic appearance.

Moreover, on the S. E. coast of Loughshinny, between Rush and Skerries, are large rocks of the Irish slate; some rotten, others not; some of them very mild, and scarce sensibly acid, others acid and austere; and in this place several of them yield vitriolic efflorescences.

In the neighbourhood of the foregoing, viz. in the hole of the copper-mine at Loughshinny, was found a stone of the same kind, but very austere, and strongly vitriolic to the taste, and water poured on it struck blue with galls, and milk boiled with it was evidently coagulated. Upon calcination it appeared to be more strongly ferruginous than the former; and moreover, a yellow, vitriolic efflorescence was found on it, very acrid and caustic.

I made several experiments in order to investigate the real contents of the lapis Hibernicus, as a possible and very probable ingredient in our waters called chalybeate; the result of which was, that it consisted of a bolar earth, sulphur, a martial vitriol, and some pittance of copper;* of these the martial vitriol seemed to be the principal or most active ingredient, as in the above-mentioned rotten grey stones.

Dr. Hill, however, in his excellent treatise on fossils, thinks alum to be the principal salt impregnating it.

It

* Methodical Synopsis of Mineral Waters.

It muſt, however, be acknowledged, as I have elſewhere and here, that there is a conſiderable latitude and variety in the nature or qualities of the ſtone paſſing under this denomination, both with reſpect to the different degrees of acidity and aſtringency, and with reſpect to the predominant ſalt contained, whether vitriol or alum; and indeed that this laſt is alſo ſometimes an ingredient, and ſometimes a predominant one of our Iriſh ſlate, and ſometimes combined with the martial vitriol, I am abundantly convinced by later obſervations, and the rather, as they may give a hint (in purſuance of the noble and beneficent deſigns of the Dublin Society) which may be proſecuted by perſons of more leiſure, to their own advantage and that of the public. Sir William Petty ſpeaks of alum works in this kingdom, and the learned Liſter (a perſon well acquainted with foſſils) affirms, that he received an alum glebe from Ireland, out of which true capillary alum did ſhoot, even as vitriol from the pyrites. But though thoſe works are long ſince dropped, I apprehend it to be no way impoſſible that they may be revived.

A. D. 1750, I viſited the coaſt near Ruſh a third time, and found ſeveral of theſe rotten ſtones, which gave ſtrong indications of alum, and of martial vitriol combined with alum.

The following appears to be an inſtance of a predominant alum with very little mixture of any thing vitriolic or ferruginous, viz.

In

In the glyn of Knockbrugg, near Holywood, are found rotten, ſlaty ſtones, partly black, and partly of the colour of yellow ochre, ſome pieces of which were of an auſtere taſte, ſome ſubacid, yet acid enough to curdle milk ſlightly. The infuſion in water had no effect on galls as the foregoing, but it extracted a deep cherry colour from logwood, and when calcined it ſtruck a crimſon colour with logwood, but had no effect on galls, which is one indication of alum, without the mixture of vitriol.

There are moreover other ſubſtances a-kin to this, but which ſeem to indicate a compoſition of vitriol and alum, on which I made ſeveral experiments.

The firſt of thoſe ſubſtances was a black earth, found near the top or ſurface of a quarry of our black building ſtone at Glaſſnevin (of which hereafter), and on the north ſide of it.

2dly. There is another black earth, called by Hill *argilla nigreſcens friabilis levis, killow*; by Emanuel Mendez de Coſta, black ore; and by Walerius, *humus nigra pictoria*, or *atramentum ſciſſile*; having derived its name from its reſemblance to the ſmut on the backs of chimnies, which is called *kellow* (as this is called *killow*) in the north of England. It leaves a dark line rubbed on paper, and is uſed for writing and deſigning, and has been uſed in marking ſheep, and ſometimes in painting.

I met

I met with two varieties of this foſſil on the coaſt near Loughſhinny, one grey, another as black as coal: this laſt rubbed on paper leaves a line of a black, the other leaves a line of a leaden colour: they are both of an auſtere acid taſte, more or leſs, and both, when diluted with water, are ſmooth to the touch.

The above-named authors, indeed, have not given any hint of alum being an ingredient in their compoſition; however, I ſhall ſhew that they exhibit two indications of alum being contained in them; viz. 1ſt. the taſte of alum; and 2dly, the red and crimſon colour extracted by them from logwood. But the *black* ſort is more ſtrongly impregnated with theſe ſalts, being of a taſte more ſtrongly acid, auſtere, and plainly aluminous, and the evidences of alum combined with vitriol in it are much ſtronger: for 1. In a ſimple infuſion of it in diſtilled water, logwood gave a red tincture in the upper part of the mixture, but galls gave very little tincture. 2. In two other experiments on a ſtrong decoction, this combination appeared by the blue tincture with galls, and the crimſon with logwood. 3. In another ſpecimen, a ſtrong decoction gave more manifeſt tokens of alum than of vitriol; for it ſtruck a laſting bright crimſon with logwood, before it ſtruck the ink colour with galls, otherwiſe than in the two laſt experiments.

This reaſoning is farther illuſtrated and confirmed by Doctor Hill's teſtimony concerning the *Lapis Hibernicus*,

who affirms, that he procured one-ninth part weight of alum in ſome of the beſt pieces of it, as likewiſe by the account elſewhere * given of the *aluminoſo vitriolic* water of Ballycaſtle; and I would adventure to recommend to perſons of more leiſure a further ſearch for alum in the ſtones and earths above ſpecified, and found in this county: ſuch a combination of alum and vitriol, we are aſſured by the accurate Macquer, in his Elements of Chymiſtry, is frequent; and Liſter affirms, that in England ſcarce any alum mine is found without a mixture of the pyrites; and Macquer moreover gives the method of ſeparating them in theſe words: "Alum is almoſt always accompanied with a certain quantity of vitriol, which renders it impure, and obſtructs its cryſtallization; for which reaſon an alkaline lye is added to the ſolution of this impure alum, which, having a greater affinity with the acid, precipitates the irony baſis, and ſo the alum is left pure and cryſtallizes."

Of Ochres and painting Earths.

OCHRE is an article of importance for painting, and for colouring gloves and ſkins yellow and brown, with which we have hitherto been ſupplied from England; but by the following enumeration it will appear, that we might be eaſily ſupplied from home; and mills might

* Methodical Synopſis of Mineral Waters, Book IV.

might be erected here as well as there for waſhing our ochres, and ſeparating them from ſand and dirt. In the county of Wicklow they have lately extracted ſilver from ſome ſpecies of the ochre.

Doctor Hill and Emanuel de Coſta reckon up no ſmall number and variety of ochres, and of different colours, as yellow, red, brown, black, blue, and green; and even in this ſmall county, I have found the yellow, red, brown, and black.

1. A. D. 1745, in a lead mine lately opened at Caſtleknock, was found a very dark-coloured ochre, approaching to umber, being darker than brown ochre, and leſs dark than umber. It is fine and impalpable, and ſaid to make a very good dark paint.

2. A yellow reddiſh ochre near Dolphin's-barn, which cauſed no ebullition with ſpirit of vitriol, and appeared to be chiefly a ferruginous earth; for it calcined of a deep red, and then fled almoſt wholly to the magnet.

3. From the neighbourhood of Ruſh, a very pale ochre, anſwering to the *ochra leviſſima friabilis, pallidiſſime flaveſcens*, of Hill's Hiſtory of Foſſils, p. 51. which alſo made no ebullition with acids.

4. A pale brown ochre, of which there is a ſmall bed at Augh Farrel (where alſo is a chalybeate ſpring). This alſo made no ebullition with ſpirit of vitriol: it reddened on calcination, was not attracted by the magnet crude, nor but obſcurely when calcined.

But I found ſeveral other ochres in this county, which excited a manifeſt ebullition with acids, *v. g.*

1. In the lead-mine above-mentioned at Caſtleknock, in the neighbourhood of that above deſcribed,* and which I found at the ſame time; it was a black earth, with a ſhade of purple of an intermediate colour, between umber and Cullen's earth. It was tried by a painter, and pronounced an excellent colour, as it dried with linſeed-oil in twelve hours only, being a much ſhorter time than ordinary colours do.

2. On the road to Ballynaſcorney a dark brown rotten ſtone, almoſt globular, ſomewhat gritty, and it efferveſced with ſome of the acids. In its crude ſtate it was ſcarcely attracted by the magnet, but when calcined it became black, and was greatly attracted.†

3. A hard, yellow, reddiſh ochry ſubſtance in a quarry at Dolphin's-barn, which made a ſtrong ebullition

* I have ſeen a yellowiſh ochre, which was brought from Summer-hill in the county of Meath, and but about twenty miles from Dublin, where it is ſaid there are many tons of it, for which reaſons I add it here, and becauſe it makes an excellent brown paint upon trial, and dries very readily. It is impalpable, does not efferveſce with ſpirit of vitriol; but it yields very ſtrongly to the magnet, even crude, and calcines to a brown red. It is very like Hill's *ochra leviſſima flava friabilis*, which is frequently thrown out of the mouths of chalybeate ſprings; and this our ochre is alſo ſaid to be ſituated near ſuch a ſpring.

† Emanuel Mendez de Coſta mentions an *ochra Indica ſaxea purpureo rubra*; which is brought from the Eaſt Indies, and of great uſe among the painters, being a very valuable colour, and by them called *Indian-ſtone red*, but is not acted upon by acids.

lition with acids, both in its crude ſtate, and when calcined.*

On the road from Caſtlekelly to Old Bawne, are frequent appearances of ochre; particularly near Glaſſamucky, a brown one to a great depth, which in its crude ſtate was not attracted by the magnet, but upon calcination reddened, and then was a little attracted: but

In the neighbourhood of the chalybeate water in or near Holywood-glynn, were found the three following ochres richly ferruginous:

1. One as red as brick, and blackiſh within, of an empyreumatic ſmell, and flies almoſt wholly to the magnet, even in its crude ſtate.

2. A brown yellowiſh one, which to the eye appears to be mixed with iron.

3. A dark brown one: both this and the ſecond in their crude ſtate are but very little attracted by the magnet; but on calcination they both become red, and then fly almoſt wholly to it.

Thoſe may be deemed iron ores, and therefore the tranſition from them to iron ſtones or iron ores will be eaſy.

* So the ochre, called Spaniſh brown, makes a violent effervescence with aqua-fortis.

Iron Stones and Iron Ores.

It hath been juſtly remarked, to the glory of Divine Providence, that, as iron is the moſt uſeful, ſo it is found in far greater abundance than any other metal; and accordingly iron ſtones are very plentifully ſcattered both on our coaſts, and in the inland parts of this county. And the two following aphoriſms ſeem proper to be premiſed to an account of theſe ſtones, viz.

1. The red and yellow earths or ſtones generally owe their colour to an admixture of iron.*

2. All earths, that are naturally red, or acquire that colour by calcination, are ferruginous.†

On our coaſt, proceeding from Raheny, was found a black, reddiſh, ponderous ſtone, of an iron colour within, which ſtruck fire with ſteel, made an ebullition with ſpirit of vitriol, and the powder of it crude was ſtrongly attracted by the magnet. And on the coaſt near Baldoyle are many of theſe iron ſtones, ſome of an aſh-colour, ſome red, ſome olive-coloured, others ochre-coloured, or having ochreous ſtriæ, ſome ſandy, many of which yielded to the magnet, even in their crude ſtate, and ſeveral made an ebullition with ſpirit of vitriol, though others did not.

In

* Lewis.

† Macquer's Elements of Chymiſtry.

In our journey to Howth was found a ſtone, part of a rock, covered with a red ruſt (ferrugo) like meal, which made no ebullition with ſpirit of vitriol, but was attracted by the magnet, even in its crude ſtate; and an experienced miner aſſures me, that pure malleable copper was obtained from an ochry matter found upon Sutton-land, between Baldoyle and Howth.

A red mill-ſtone from Ireland's Eye; it ſtruck fire with ſteel, and the crude powder was attracted by the magnet, as was an ochre-coloured and rotten ſtone found in plenty on the N. E. ſide of Lambay iſland, and when calcined became of a deep red, and was ſtrongly attracted, and emitted a bluiſh flame.

Another of theſe ſtones, on the coaſt between Swords and Ruſh, had veins as red as blood, eſpecially when moiſtened. And on the coaſt from Ruſh to Skerries and Balruddery, beſides plenty of iron mine, I ſaw ſeveral varieties of the iron-ſtone, which were attracted by the magnet in their crude ſtate; and on Holmpatrick are reddiſh ſlaty ſtones, which are partly ferruginous.

Near Loughſhinny (where is alſo copper and vitriol), a brown rotten ſtone, which made a ſtrong ebullition with ſpirit of vitriol, burnt blue, and on calcination was ſtrongly attracted by the magnet, being a compoſition of ſpar, iron, and ſulphur.

I obſerved theſe ſtones to be frequent, particularly in the neighbourhood of ſeveral of our chalybeate ſprings (ſomething like theſe being undoubtedly the matter

matter impregnating them), as near Curtlagh, near Angh Farrel, Kilmaſheoge, and Holywood, which alſo owned the magnet in their crude ſtate.

A great number and variety of theſe ſtones, as red, pale-red, pale-brown, iron-grey, occurred in the more inland parts, as in our walk to Rathmines, Kilgobbin, Rathfarnham, Grange, and Bell-alley: and

On the lands of Mulahoo a red ponderous ſtone is found in plenty, which cauſed no ebullition with ſpirit of vitriol, and in its crude ſtate was but little attracted by the magnet, but ſtrongly when calcined, and emitted a deep blue purpliſh flame, indicating iron and ſulphur.

But the following ſubſtance appears to be much leſs rich of the metal, than any of the foregoing, viz.

In a limeſtone quarry at Howth, are found ſmall roundiſh *nodules* of a brown yellow colour, as big as a walnut, but of a ſtony hardneſs: they effervеſced ſtrongly with ſpirit of vitriol, and being roaſted became as red as brick, but were very little attracted by the magnet, containing only a ſmall proportion of iron blended with a ſparry matter. They ſeem to belong to the *ſiderorchita* (ſparry iron ore), or *cruſtated ferruginous bodies*, minutely deſcribed in Hill's Hiſtory of Foſſils.

It is ſaid that iron-works were formerly erected in this county, though none ſubſiſt at preſent; and on the weſt ſide of the Hill of Howth iron mine is found; and on the ſhore near Ruſh, and at Loughſhinny on the ſurface

ſurface of the ground, particularly a ſpecies of the Hæmatites or Blood-ſtone, a red ſtone deſcribed to have botryoid protuberances on the ſurface, which was attracted by the magnet even in its crude ſtate.*

Of Vitriol.

I have before ſhewn the preſence of this vitriol in the account given of our Iriſh ſlate, but there it ſeems to be ſometimes combined with alum; but I am now to conſider it in its ſimplicity, in which indeed it ſeems to exiſt in moſt of our bogs; for it is obſerved, that the roots, bodies, and branches of oak, alder, and other foreſt trees, though ſoft when firſt raiſed, when dry become uſeful timber, but always black, a diſtinguiſhing mark of the ferruginous vitriol.

Alſo, the native green vitriol is frequently found about the mines in the county of Wicklow, and at the lead-mine at Cloghran in this county, where alſo copper was found.

I ſhall here annex ſome few obſervations, which may ſerve at leaſt to illuſtrate the gradual proceſs of nature in the generation of the martial vitriol.

* This ſtone is found in great plenty about Whitehaven, and is one of the richeſt of the iron ores, yielding it is ſaid $\frac{1}{2}\frac{2}{5}$ parts of iron; and Smith, in his Natural and Civil Hiſtory of the County of Kerry, remarks, that in the bloomeries they uſe about one-ſixth part of the Engliſh red mine to one of our poorer ores, in order to render it leſs brittle or more malleable than our ore would be, if uſed alone.

At Loughſhinny near Ruſh, and on the ſtrand, beſides iron-mine in plenty on the ſurface of the ground, is found copper ore, and a work for it was begun by Benedict Arthur, Eſq. but not proſecuted; and on the coaſt N. E. from Loughſhinny we diſcovered

1. In a neighbouring ſhaft opened for the copper-mine, a white efflorescence, partly like ſnow, and partly in the ſhape of *ſtiriæ* cryſtals or icicles, which evidently appears to be true martial vitriol; for it was of a ſweet inky taſte, and the ſolution of it turned preſently of a deep blue with galls, but green with ſpirit of ſal ammoniac, ſo that this efflorescence has plainly the marks of mature martial vitriol.

2. A. D. 1748, I reviſited this coaſt, and examined a certain yellow efflorescence exuding from a ſpecies of the Lapis Hibernicus (a black rotten ſtone) which efflorescence was of a ſtrongly acid taſte, and cauſtic on the tongue, reſembling a compoſition of vitriol and alum (ſee the account of the Lapis Hibernicus above).

Spars, Petrifications, Cryſtals, and Baſtard Gems.

I. OF SPARS.

Varieties of this body, ſome pellucid, others white, ſome yellowiſh, ſome tinged with green ſpots, ſome brown, ſome rhomboidal, others ſhot into cryſtals like nitre, occurred in ſeveral quarries, and about the lead-

mines,

mines, and on the ſhores in this county, a minute deſcription of which would be of little uſe: it ſhall ſuffice to refer to Walerius's Mineralogy, and Hill's Hiſtory of Foſſils, for the deſcription and figures of a variety of them.

2. OF PETRIFICATIONS, CRYSTALS, AND BASTARD GEMS.

As theſe are matters rather of curioſity than real uſe, my account of them ſhall be but ſhort.

Among the VEGETABLE PETRIFACTIONS, which occurred in this county, were the following:

1. Moſs petrified from ſome ſprings of waters ſlowly dribbling down.

2. *Lapides Fungoides*; or *Lapides Fungiti*; or *muſhroom ſtones*: a foſſil coral, according to Hill. See the figure, Hiſtory of Foſſils, page 642.

3. *Coralloides Stalagmites*; it is near a-kin to the *oſteocolla* before deſcribed; and Hill remarks, that all the cruſtaceous ſpars are ſome time or other found emulating the form of *oſteocolla*. It is found in large rocks by the river ſide, between Caſtlekelly and Old Bawne, and uſed as ornamental to the walls and door-caſes of ſeveral of the ancient churches. See a further account of the above under *Oſteocolla*.

4. *Lapis Stelechites*; a ſtone reſembling the roots of trees. It is plainly a ſpecies of the *oſteocolla*.

5. *Lapis Vermicularis*, according to ſome, as having the appearance of worms petrified, but the *Tubulares* of Hill, according to whom they are corals compoſed of longitudinal pieces of the figures of ſo many worms ranged parallel to one another in a maſs.

6. A petrification reſembling a bundle of aſparagus petrified, delineated in Hill's Hiſtory of Foſſils, under the denomination of *Junci lapidei*.

7. Petrifications having the branches of plants delineated on them. In our journey to Corballis the lower,

Among the ANIMAL PETRIFICATIONS were the following:

Aſteria, *Aſtroites*, } Star-ſtones.

Belemnites, or the thunderbolt (though ſome place this among minerals).

Buccinitæ: petrified whilks.

Ammonites lapis, *Cornu ammonis*, vulgo, ſerpent-ſtones.

Cochlea petrificata: ſnail petrified.

Echinus marinus petrificatus: ſea hedge-hog petrified.

Entrochi: ſee Hill and Walerius, being reckoned to have been the joints of the ſtar-fiſh.

Lapis Judaicus, ſaid to have been found in a quarry at Raheny, being ſuppoſed to be the ſpines of the *Echinus marinus* petrified.

Lapis Mytulites: the muſcle petrified; one on Howth ſhore. It did not effervеſce with acids.

Lapis

Lapis oſtracites: oyſter-ſhell petrified. This alſo did not effervesce with acids.

Patella petrificata: the limpet petrified.

Lapis pectinites; the ſcallop petrified.

Pectunculus petrificatus: the cockle petrified.

Perlæ: pearls, found in Poolbeg oyſters.

Trochitæ: ſo called from their reſemblance to a boy's top, and ſaid to be artriculations detached from the vertebræ of the back of a ſort of ſea-worms, in the form of a wheel, hollow in the centre.

Among the MINERAL PETRIFICATIONS are,

1. Limeſtone-gravel, which hath been conſidered above, under the article of manures.

2. Mill-ſtones.

3. A kind of rock-marle, or a petrification reſembling an artificial plaiſter, but harder on the N. ſide of the Liffey, on the ſide of a bank near Knockmaroon, and on the banks of the Dodder. It broke white within, effervesced ſtrongly with acids, and burnt to a lime.

I received two other ſpecimens like theſe from the county of Armagh, and near it, where it was uſed as a rich manure.

4. Petrifications or ſtony incruſtations of vaſt extent, formed by water dribbling along the rocks upon the ſtones, in a cave on the ſhore near Portrane, where is a petrifying ſpring. From the ſame rocks were collected white ſtony incruſtations, with a tincture of green;

green; they effervesced strongly with acids, and were reduced to a strong lime in half an hour, previously burning blue and purple from the sulphur, to which the greenish cast seemed to be owing.

Lapides Stalactitii: stony icicles, or drop-stones, or, according to Woodward, spar formed in the shape of icicles. At a quarry near Lucan, and in the two different caves on the north-west shore of the Hill of Howth, and one formed by the dropping petrifying spring on the east side of that hill.

A clear illustration of the recent formation of these, even from a calcareous matter, suspended in water, and deposited on stagnation, occurs very frequently in icicles like these, formed on the under side of arches, from the rain-water slowly transuding through the limy cement.

The greater part of the petrifications above enumerated are of the calcareous kind, making an ebullition with acids, and being reducible to lime; but there are many instances of petrifications altogether of another kind, viz. which resist the operation both of acids and of the fire. So the *lapis mytulites* and *ostracites* above mentioned make no ebullition with acids; the last was of an iron colour, and consisted of a considerable portion of iron, burning to a dark red colour, and then yielded greatly to the magnet; and to these we add

Several flinty bodies, or at least stones, which struck fire with steel, and excited no ebullition with acids, from our shore, one of which had ramifications as of

the

the ſpines of ſome fiſh; another had the ſhape of a ſcrew inſcribed on it.

Many of the petrifications * above-mentioned are found in places, where the water has no influence in forming them, even in places remote from either ſprings, the river, or ſea; and conſequently, ſuch petrifications ſeem rather to have been effected by mineral ſtreams.

That which is called a tranſmutation of iron into copper, in ſome copper mines, particularly one of ours in the county of Wicklow (but which is no more than a precipitation of the copper, in the room of the iron, taken up by the menſtruum, from its ſuperior attraction or affinity to the iron), is a beautiful illuſtration of the transformation of vegetables and animals into ſtone, aſſuming the ſhape of the vegetables and animals, either immerſed in petrifying waters, or expoſed to mineral ſteams, impregnated with ſparry or other particles, which are precipitated, and occupy the place of the petrified bodies.

* Thoſe petrifications, where the pyrites is the moſt conſiderable ingredient, are another inſtance to the ſame purpoſe; and ſo is our Lough Neagh ſtone, which alſo reſiſts both acids and fire, and loſt nothing of its weight when kept ſeven hours in a red-hot crucible; and, when kept in the greateſt fire, that a wind-furnace could give, for eight hours, which vitrified the crucible, it was not changed.

Of Cryſtals.

CRYSTALS are hard, pellucid, and naturally colourleſs bodies, ſtriking fire with ſteel, not effervescing with acids, nor reducible to lime by the fire as ſpars, but many of them vitrifying in a violent degree of heat; though Neuman obſerves, that they are more difficultly fuſible than ſand, and require about an equal weight of alkali for the vitrification.

The Kerry ſtone is of this ſpecies of foſſils, and we have ſeveral of them in this county, as at Loughſhinny, where it is called rock-cryſtal, hexagonal, and of other figures; and at a lead-mine opened at Caſtleknock, and in a quarry at Raheny, hexagonal and octangular in a ploughed field at Rob's-walls.

They have been formed into ſleeve-buttons, ſeals, covers of ſnuff-boxes, ſet in rings and buckles, and have been often ſold for real gems; for whereas cryſtals, as well as ſpars, frequently receive various tinctures from the metals combined with them; and as the real gems have frequently the hexangular figure and colour of cryſtals, theſe laſt are frequently miſtaken for them even by jewellers, *v. g.* the cryſtal, accidentally tinged with green, is ſold under the name of the occidental emerald;* and moſt of the topazes worn in rings

* The little pains that have hitherto been beſtowed on enquiring into the foſſils of this country conſidered, it is no wonder

rings are, according to my author, Doctor Hill, of this kind.

Of Limeſtone.

THIS is an article of very extenſive uſe and importance, even to builders, ſoap-boilers, tanners, ſkinners, in agriculture as a manure, and even in medicine.

Dublin is very happily ſituated in reſpect to the great plenty of it in its neighbourhood, and conſequently the cheap carriage of it. It ſupplies a better lime, and ſtronger cement, than that in London made of chalk,

wonder, that very few inſtances of real gems, found here, ſhould have appeared; however, diſcoveries even of theſe, ought not to be deſpaired of; for Smith's Hiſtory of the Co. of Kerry mentions the amethyſt, and we have good authority for another, in an account publiſhed of the Giant's Cauſeway, in the Philoſophical Tranſactions, by Dr. Pocock, viz. that among the ſtones of the ſaid cauſeway a certain rough pebble was found, which, when poliſhed, proved to be a white carnelian.

☞ Since the above was committed to the preſs, there was ſhewn me a foſſil, brought from a quarry of our black building-ſtone near Dunſink, under the denomination of a ſpar, to the character of which it in no wiſe anſwers, but is of a far ſuperior hardneſs and brightneſs, being a thin incruſtation, conſiſting of minute fleaky bodies, ſtrictly adhering to one another, and to the ſubjacent ſtone, of a bright white, like ſilver, but much more glittering, and is uſed as an ornament in buttons, ear-rings, and ſnuff-boxes. There is indeed a ſparry opake matter interſperſed, but the brilliant parts ſtrike fire plentifully with ſteel, emit a ſulphureous flame in burning, and leave a dark red powder, ſo that it appears to be a marcaſite, and is accurately deſcribed by Hill, in his Hiſtory of Foſſils, p. 610, under the denomination of *marcaſita argentea*, or ſilver-coloured marcaſite.

which makes a weaker lime; and hence our buildings are firmer, and leſs liable to be injured by fire. It is found on every ſide of the town on the low lands, even to the extremities of the county, *v. g.*

On the ſouth ſide, near Miltown-bridge, was formerly one of the beſt quarries in the county; and more lately, on the road to Miltown, a black limeſtone, beginning to rot, and impalpable.

Near Killikee a rotting one.

Going to Rathfarnham, a quarry worn out.

Near Smith's mills, famous for the building-ſtone (of which hereafter), is a quarry.

It abounds on the river-ſide from Ringſend up to Rathfarnham, Templeoge, &c.

On the weſt ſide, a blue rotten one at Dolphin's-barn, in the neighbourhood of the lead-mine.

At Aſhtown, Shoulder of Mutton, Blue-bell, Cappock, Dunſink, and Diſwel's-town, are quarries.

In the road to Lucan, a quarry of limeſtone and calp.

Between Lucan and Eſker.

On the north ſide of the Liffey, oppoſite to Hermitage.

Near Luttrel's-town, a quarry of building-ſtone and limeſtone.

Between Clondalkin and Dublin, quarries.

Near St. Catherine's.

At or near Newcaſtle, quarries; and north of Rathcool; and from Rathcool to Clondalkin.

On

On the road going to Bleſſingtown, near Saggard.

At Crumlin, and from thence a vein of it is extended to Saggard.

On the north ſide, near upper Corballis and Cloghran church; and at the other Cloghran, northerly, is a quarry of a ſofter kind, fit for plaiſtering.

Near St. Margaret's, where is a tepid water.

At Swords.

At Chinkwell.

Near Portrane, and near Ruſh.

Near Argillam; and

Excellent about Skerries.

On the North coaſt.

At Naul good, and the very pavement conſiſts of it; and Oldtown conſiſts of rocks of it.

Feltrim-hill and Carrick-hill are all limeſtone.

On the eaſt ſide, in plenty at Raheny.

Near the lower part of the Hill of Howth, and on the coaſt of Howth, are quarries.

From Raheny to Baldoyle, a quarry.

On the coaſt from Portmarnock to Malahide, grey rocks of it.

On the ſhores going to Dunleary, Bullock, and Mountown.

At Kilcragh, near Donnabate, a quarry.

Next, it is worth while to attend to the variety there is in the texture and compoſition of parts in different limeſtones, and in the uſes they are proper to be applied to.

The greater number are of the grey ſort; the white ſparry ſort are not ſo valuable, for reaſons to be hereafter aſſigned. Some few are chalky.

Several of thoſe at Raheny, at Sutton, at the Hill of Howth, and at Swords, bear a poliſh approaching to marble.

Vice verſa, at Dolphin's-barn, near the lead-mine, is a blue rotten limeſtone.

We have alſo in this county a grey limeſtone, capt with flint, and ſtrata of flint incorporated with limeſtone.

Many of them exfoliate or rot in the air, throwing off ſcales year after year, and by this means become a good manure. Some become black, and ſome ochre-coloured on their rotting; the laſt ſeems to be from ſome contained iron, and this decompoſition may be owing to the oxygene of the air firſt changing the iron into vitriol, and then leaving the ochre.

N. B. Neuman ſhews the preſence of the marine acid in limeſtone, both crude and calcined; and it is certain the calcareous earth, thus combined, attracts the moiſture of the air.

Some contain the delineations of cockles, muſcles, leaves of trees, moſs, worms, and other things; *v. g.* at Howth, at Crumlin, and at Cloghran church, where the limeſtone is ſofter, and fitter for burning; but at Raheny, the vein extending from Cloghran to Feltrim, Raheny, and Howth, is more ſolid and hard, and fitter for building.

I found

I found a yellowiſh and almoſt pellucid one at the Daniſh mount, near Foreſt; and near Corballis, one whoſe external coat was grey, the interior part brown and rotten: the external part was calcined to lime; the interior, applied to the like degree of fire, yielded much to the magnet, ſo that here is a combination of iron. In another near St. Margaret's, wherein there is an intermixture of an ochre-colour, ſomething ferruginous is betrayed, but in a leſs degree.

Some of them are beſpangled with yellow, ſhining, pyritical bodies, ſome of which, beſide their ſulphur, ſhew copper by the blue tincture they give to ſpirit of ſal ammoniac. Some are marked with black ſpots as from ink, as on the ſhore of lower Corballis, which ſmelt remarkably ſulphureous on colliſion, and ſparkled a little on the red-hot iron, the black colour being allowed to be owing to the phlogiſton. And, as to the poſition of their ſtrata, there is not leſs variety with reſpect to their inclination to the horizon; ſome perpendicular, ſome parallel, others of various intermediate degrees.

And laſtly, with reſpect to the uſes of the different ſorts, the rotten ſort is of uſe as a manure, and I have known it to ſcour braſs well.

The harder ſort is fitter for building; *v. g.* that from Sutton, approaching to marble, and makes a ſtronger cement, like terras, and enduring under water as gypſum: the ſofter and white ſparry ſort ſerves for plaiſtering,

plaiſtering, and for burning for manure, but does not make ſo ſtrong a cement as the grey ſort generally does.*

It is alſo worth conſidering as an article of commerce: *Non omnis fert omnia tellus*, is verified in this inſtance; for Arklow, and ſome parts of the county of Wicklow, having none of this article, are ſupplied from Howth, and lately by a black ſort from the county of Carlow, one of the beſt limeſtones in the kingdom; and I am informed, that the Dutch are ſo well acquainted with the excellency of our Iriſh lime, as to have imported it from hence.

Of Marbles.

THEY are a ſubdiviſion of limeſtone, and defined to be ſtones forming continued ſtrata, bright and beautiful, of very lively colours, and of a conſtitution ſo fine, that they will readily take a good poliſh: they are moderately hard, and do not give fire with ſteel, excite an ebullition with acids, and burn to lime with a ſlight fire.

The

* So Doctor Short remarks, that the dark-brown, grey, blackiſh, and jet-black limeſtone, though difficult and expenſive to burn, is ſeldom uſed but for building bridges or churches, becauſe it preſently turns hard after burning, and is of perpetual duration, even more laſting than the ſtone itſelf, neither air, time, nor weather weakening its cement.

The quantity of marble in this county is not very conſiderable; nor is it remarkable for that variety of colours, which adorns thoſe of ſome other counties. We are not, however, deſtitute of it; for among the limeſtones at Howth and Raheny, are ſome that bear the poliſh; and at Kinſealy is ſaid to be a bed of excellent marble, and at Loughſhinny a quarry, where ſome of the marbles are ſaid to have petrified ſhells incorporated with them; alſo, marble is found at Kilcragh, near Donnabate, on the eſtate of Maurice Keating, Eſq., and on a bank eaſt of Clonſkeagh-bridge; but particularly at the rocks called the landing-rocks, near Rob's-walls, on the coaſt going from Portmarnock to Malahide, is a large vein of black and ſome white marble, conſiſting of huge rocks, like Kilkenny marble, and in it are here and there repreſentations of white ſhells; and Richard Talbot, Eſq. ſhewed me a ſample of black marble, variegated with white, from a large quarry of it at Malahide, which takes a fine poliſh, and is little or not at all inferior to the Kilkenny marble.

I obſerved in the hollow of ſome of the rocks abovementioned, what appeared to me to be the rudiments of ſuch petrifications, viz. divers ſhells and ſmall ſtones, which were ſo ſtrongly agglutinated to the rocks, that it required a great force to ſeparate them.

As an encouragement to the proſecution of works of this kind, it has been obſerved, that the lower one goes down, the better the ſtone.

Of

Of the Baſanite, or Touchſtone.

It is a black ſtone, even harder than marble, for it ſtrikes fire with ſteel, which very few of the marbles do, nor does it effervesce with acids, which all marbles do; this was found on the river ſide, going to Old Bawne.

It receives the colours of gold, ſilver, copper, and braſs rubbed on it; the gold colour not being deſtroyed by any thing but aqua-regia, whereas the colour of the other metals is inſtantly deſtroyed by aqua-fortis, ſo that by this means counterfeit money is detected.

Of Slate, and the Building-ſtone of Dublin, a Sympexium or Rock-ſtone of Hill.

The ſituation of the city of Dublin, with regard to the laſt of theſe ſtones, is not leſs happy than what it has been obſerved to be with regard to the limeſtone, there being quarries of it on every ſide of the town, as will appear in the following enumeration, and with it, alſo, divers other ſtones a-kin to it, and of great uſe in the furniture of our houſes, and otherwiſe.

Theſe ſtones, as to their internal conſtitution, may be ranked as of a middle claſs, between the *ſympexia* or rock-

rock-ſtones, and the *ſteganiæ* of Hill, or, in more vulgar language, between the limeſtone and ſlate, having more calcareous matter than the laſt, and leſs than the firſt.

The firſt, or rock-ſtones, are defined to be "Stones forming continued ſtrata, of a cloſe, ſolid, ſmooth texture, or compoſed of no viſible grit, and generally deſtitute of brightneſs, though in ſome degree capable of a poliſh."*

The ſecond, viz. ſlates, are deſcribed to be "Stones of a cloſe, compact texture, of a laminated ſtructure, ſplitting into plates, which eaſily vitrify, and do not ſtrike fire with ſteel."

Our building-ſtone and limeſtone are frequently found in the ſame quarry, as are likewiſe the limeſtone and ſlaty ſtones; and many of our building-ſtones (though not of the beſt ſort) are flakey, mouldering into laminæ or ſcales in the air, and do not burn into lime.

Theſe ſtones then, occupying a middle place, between the limeſtone and ſlate, and an account of the limeſtone having been already given, it ſeems not to be out of method to premiſe ſome account of the ſtate of the *ſlates* and *ſlaty ſtones* of this county. As to the Lapis Hibernicus, or Iriſh ſlate, as it is chiefly to be conſidered as a vitriolic ore, it ſhall ſuffice here to refer to the account above given of it as ſuch (being,

* See Hill, and Emanuel de Coſta's Hiſtory of Foſſils, and Walerius.

as to its internal conſtitution, entirely different from other ſtones of the ſame general denomination), and to give a tranſient view of the ſlates and ſlaty rocks in this county, whether of any, or no value, for the purpoſe of covering houſes, as tiles.

On the mountains S. and S. W. of Rathfarnham, ſlates are the prevailing ſtone, and it is ſaid that the whole tract, extending from thence to Bleſſington, is chiefly ſlaty; and even at Rathcool their fireſtone chimney pieces are not ſupplied from their own neighbourhood, but from that of Bleſſington; and on the mountains S. W. of Rathcool, ſlaty rocks are the moſt remarkable; and in a mountain near that town is a quarry of ſlate, but not wrought, being not very good; from all which appears the abſurdity of appropriating the appellation of mountain-ſtone to our fireſtone or granite (of which hereafter).

On Barneſlingan-hill is a heavy ſlate, and not ſo fiſſile as that from Bleſſington, yet capable of being ſplit; and, for want of better, ſome cover their houſes with it. At Friarſtown ſome ſlates are brought from the mountains adjacent.

At Ballyman is a red ſlate, which on calcination turns redder, and is then a little attracted by the magnet; and in our journey to Bullock and Dalkey were found bad ſlates: near O'Farrel are ſaid to be better, and capable of ſplitting, and ſerving for the purpoſe of tiles in covering houſes.

On

On the ſouth ſide of the Hill of Howth is a bad ſlate, too heavy for that purpoſe. At Ireland's Eye is a red and grey ſlaty ſtone; and beyond Portrane, viz. on the ſhore oppoſite to Ireland's Eye, are grey and red ſlaty rocks.

Between Palmerſtown and Hermitage is a quarry of a black ſlaty ſtone.

Thus it appears, that there are few or no good ſlates yet diſcovered in the county, the goodneſs of which, viz. for the purpoſe of covering houſes, is proved: 1ſt, by the ſound; 2dly, by weighing and ſoaking ſix or eight hours in water, and, if it weighs heavier, it will not long endure without rotting the laths or timber.*

What anſwers this character, being the *ardeſia vulgaris, lapis fiſſilis, durus, cæruleſcens, clangoſus, ardeſia tegularis Walerii, Mineralogie,* is ſupplied to us from Wales; and what makes the neareſt approach to it is brought from the neighbourhood of Dunlavin and Bleſſington in the county of Wicklow; and the beſt are ſaid to be found at Dowding's-town on the borders of the county of Dublin† and Kildare.‡

* Emanuel de Coſta's Nat. Hiſt. of Foſſils.

† Linnæus gives an excellent hint concerning the origin of the *lapides ſchiſti*, viz. *Ex humo paluſtri originem ducere lapidem ſchiſtum ſuadent vegetabilia, quæ huic ſæpius incluſa reperiuntur.*

‡ It is a great miſtake in the Natural and Civil Hiſtory of the County of Waterford, that rag-ſtones were called black building-ſtone in Dublin, as will abundantly appear in the ſequel.

Rag-ſtones merit a place here, by reaſon of their affinity to ſlate, being placed among the *lapides ſchiſti* by Emanuel de Coſta, being a uſeful ſtone, viz. for giving a ſmooth edge to iron tools, after being ground on rougher ſtones. We are ſupplied with this ſtone from Wales, but it ſeems not improbable, that further ſearches might diſcover as good here; for theſe ſtones abound on the ſhore of the river Dodder, particularly from Old Bawne to Caſtle-kelly, being a gloſſy ſtone, conſiſting of ſtraight ſtriæ, moſtly grey, rarely of a duſky red, and often appear as if cut off like a chip of wood, being the *ſchiſtus viridi-cinereus* of Emanuel de Coſta; and ſome few on this ſhore are found upon trial to be good for ſharpening knives and ſhoemakers awls.

They are alſo found ſcattered in other places, as at Tara-hill near the paper-mills, and near Ballynaſcorney; and a bluiſh and fleaky one was found in our walk to Dunſink; and at Stag's-town, in the pariſh of Rathfarnham, a brown one, like petrified wood.

Of the Building-ſtone of the County of Dublin.

I return now to give ſome account of our building-ſtone, and others agreeing to it in their internal fabric, in which there is a conſiderable variety with reſpect to colour, hardneſs, and ſolidity: they are gene-

rally

rally darker coloured than limeſtone, containing more carbon, and leſs calcareous matter, and for this reaſon make leſs ebullition with acids than the limeſtone; and their ſtrata in different quarries differ greatly with regard to their poſition to the horizon, as will appear in the following enumeration.

On the eaſt ſide of the city, near Stephen's-green, is a quarry, which (A. D. 1763) has been opened twelve years, and has enriched its proprietor, conſiſting of a grey ſtone like that of Curſis-ſtream (of which hereafter), being the *ſaxum duriſſimum caruleum* of Emanuel de Coſta;* the ſtrata are almoſt parallel to the horizon. Here are alſo flags and hearth-ſtones; and under the above-named is a layer of limeſtone.

At Cabragh were found two quarries of a grey ſort.

N. B. As the preſent enquiry has been of ſome years ſtanding, ſome of the quarries, once opened, will not now be found.

At Glaſſnevin a quarry of the black ſort, ſomewhat reſembling that at Curſis-ſtream; the ſtrata were perpendicular to the horizon; the ſtone made but little ebullition with ſpirit of vitriol.

Near Finglaſs bridge two quarries, the poſition of the ſtrata whereof was nearly perpendicular to the horizon.

Near Finglaſs, and eaſt from it, a good black ſort, ſome of the layers of which were eighteen inches thick,

* Nat. Hiſt. of Foſſils.

thick, and in an inclined poſition of about 45 degrees. The worſe ſort mouldered in ſcales.

At Curduff bridge, a quarry of this and of lime-ſtone, where the poſition of the ſtrata is horizontal.

Near Clonee, a quarry of the black ſort, and all along Tullagheen river to Admiral Rowley's.

Near Artane, a quarry formerly wrought, of a bluiſh and ſomewhat flakey ſtone: it made ſome ebullition with ſpirit of vitriol, but not ſo much as limeſtone, nor did it burn to lime.

Beyond Coolock, another flakey ſtone, more rotten, and which made a ſtronger ebullition with ſpirit of vitriol, and ſmelt ſulphureous on colliſion.

At Field's-town, a quarry of flag-ſtones, which may be reckoned a ſubdiviſion of this ſtone, often ſplitting into laminæ, and making an ebullition with aqua-fortis.

At Foreſt and Stradbally are flag-ſtones.

About Knockſedan, a quarry of hard ſtones in large pieces, ſome of ſix or eight feet long, four broad, and two thick; and a grey one there, not ſo good, but ſub-ject to be rotten.

At Kilſoghan, a ſmall quarry of a hard, blue ſort, which made no ebullition with ſpirit of vitriol, nor burnt to lime.

At Ward, a quarry of good ſtone, though a little flaty; it made but a little ebullition with ſpirit of vi-triol, and did not burn to lime.

Near

Near Brazeel, and near Rathbeale, quarries of the black ſort: at Brazeel a quarry of a greyiſh blue, and ſome of the ſtones large: one was a foot deep, two feet broad, and ſeven feet long.

At Chapel-midway, a ſmall quarry of the like ſtone.

At Graliagh another.

On the lands of Mullahoo another quarry: ſome of theſe ſtones are rotten, others ſound, but both excited an ebullition with ſpirit of vitriol, and in ſo doing emitted a fetid ſmell, reſiding in, and thus manifeſting the phlogiſtic (not to ſay ſulphureous) matter, diſengaged from the calcareous earth diſſolved by the acid.

At Swords, a quarry of this ſtone; and the like frequency of quarries of this ſtone is obſervable on every ſide of the city, *v. g.*

At Crumlin, a grey ſort, in plenty.

At Dolphin's-barn, a blackiſh ſort, and ſupplies hearth-ſtones, flags, and head-ſtones: it is not affected by ſpirit of vitriol, ſo ſtrongly as the limeſtone of Crumlin, nor reducible to lime. The ſtrata dipt at an angle of 45 degrees.

At Madden's, oppoſite to Clondalkin, a fine quarry of black flag-ſtones.

At Luttrel's-town, a quarry of building-ſtone and limeſtone.

Near Palmerſtown, a quarry of a firmer ſort than that at Curſis-ſtream, being leſs ſcaly, and having ſtood good in the great houſe at Palmerſtown eighty years.

At

At Lucan two quarries of a good ſort.

At Blue-bell ſeveral quarries of a grey ſort, and extended here and there to Clondalkin.

At Dunſink, a blue and flaky ſort: it made but little ebullition with ſpirit of vitriol.

But the moſt noted quarry in the county is of a dark grey, or black ſort of ſtone, though not much uſed for building, except of walls, at Curſis-ſtream:* ſome parts of it are ſlaty, but theſe are rejected. It is wrought into beautiful chimney-pieces, ſmooth, and not inferior to marble, except a little in gloſs and hardneſs. It excites an ebullition with ſpirit of vitriol; but leſs than limeſtone. Kept ten hours in the fire, loſt its black colour, but did not ſlacken with water, nor acquire the taſte of lime. Some odd pieces carry a natural poliſh on their ſurface, like coal or jet. It alſo ſupplies black flags for flooring, hearth-ſtones, ſtones for piers, head-ſtones, and tomb-ſtones: all theſe effervеſce with aqua-fortis diluted, but leſs than limeſtone; all which are ſmoothened on the ſpot, with Wicklow ſand and water. One of theſe ſtones has ſtood an hundred years in Michan's church, Dublin, without ſcaling.

Some of theſe ſtones have ſpars and cryſtals adhering to them, in their interſtices, as in limeſtone; and ſome the ſmall braſs-coloured pyritical bodies interſperſed

* It is what Mr. Kirwan calls calp, and is peculiar to this county.

ſperſed upon them here and there, which laſt is a mark of their being more ſulphureous, and known and pronounced as ſuch, even by the workmen; and ſome have the *micæ argenteæ* interſperſed; all evidences of the ſparry, cryſtalline, ſulphureous, and ſometimes micaceous matter, entering into the compoſition of this ſtone.

At Smith's mills, ſituate on Stubbin's land, by the river Dodder, about half a mile to the ſouth-weſt of the city, is a very ancient quarry, of a hard, black, and, as it were, flinty kind of building-ſtone, and deſcribed by Hill under the denomination of *ſympexium ſiliceum*. This has leſs ſparry matter than the common building-ſtone, being leſs affected by acids, is deemed the hardeſt of any in the county of Dublin, being ſo hard as to ſtrike fire with ſteel, harder than many marbles, and acquiring an additional hardneſs by the weather; and the old ſpire of St. Patrick's in Dublin is ſaid to have been built of it. It is not a marble, for it does not admit of a poliſh, but only of being ſmoothened by ſand. Its hardneſs is ſo great, that, when long expoſed, it can ſcarcely be cut at all, which is one diſcouragement to its uſe. On the contrary, the ſtones of ſeveral of the quarries near it ſoon moulder into ſcales with the weather, and ſhould be uſed only for inſide work. This has not always been attended to by the overſeers of our public edifices, where we frequently ſee theſe laſt mouldering in a few years;

however, partly from their eaſineſs to be cut, and partly by the ſituation of ſome of theſe ſtones nearer at hand, and conſequently the cheapneſs of carriage, they are uſed in preference to the other more ſolid and durable ſtone, even in thoſe parts of the building, which are moſt expoſed to the weather: but ſuch perſons build for themſelves, and not for poſterity.

To the like purpoſes it may not be uſeleſs here to ſubjoin a uſeful document, with regard to the diſtinct and reſpective uſe of different ſtones in building. At the Red Cow near Dublin, where are quarries of theſe ſtones, the workmen, in their language, diſtinguiſh one ſort of ſtone by the name of *Wallers* or *Waller*; and I found, upon trial, that theſe were ſuch as conſiſted more of a flinty than a calcareous matter; that they ſtruck fire with ſteel, and made no ebullition with acids; ſuch ſtones bearing the weather, and therefore being fit for building of walls where they laſt long, quite otherwiſe than the flaky ſort, and even than ordinary limeſtone, both which moulder in the air, and are rather fit for the inſides of buildings, where they are not expoſed to the air. This ſtone, on its ebullition with ſpirit of vitriol, ſtinks for the reaſon given.

This quarry alſo ſupplies head-ſtones, tomb-ſtones, hearth-ſtones, and flags; and the ſteps going up to Paul's church, London, are ſaid to be made of theſe laſt. The four laſt named ſtones do all make an ebul-

lition

lition with ſpirit of vitriol, but leſs than limeſtone, nor are they reducible to lime by calcination: they acquire a degree of poliſh by rubbing with Wicklow ſand and water, on the ſpot, as thoſe of Curſis-ſtream.

There is alſo a black ſort of the building-ſtone on the north of the Dodder at Milltown; and in one of the walls adjacent to the quarry there frequently occurs a ſtone, which is flinty in the centre, concreted to a calcareous matter ſurrounding it. The like occurs at Crumlin.

Laſtly, in travelling to the eaſt, one meets with frequent quarries of this ſtone, *v. g.* near the gallows beyond Stephen's-green, a dark grey ſort, and very good, and, by reaſon of its ſituation near the town, very profitable to the proprietor.

At Clontarf, a quarry of a bluiſh ſort, ſcaling in the air, but not much: and on the road going to Killeſter were thoſe formerly called the Black quarries, by reaſon of the blackneſs of the ſtone. Some of the ſtones of the laſt named quarries are almoſt as hard as flint (and ſo like thoſe above of Smith's mills), and ſome ſtrata of them have a bed of black flint in their centre, of half an inch thick, the upper and under ſtratum of the ſame ſtone being the matter of the common building-ſtone.

In the ſame quarry were alſo found flag-ſtones, often ſplit into laminæ or ſcales, which are affected by acids, but leſs than the common building-ſtone.

On the ſtrand near Booter's-town is a grey ſort; and on the ſouth ſide of the Hill of Howth this ſtone is found in great plenty, and of a good ſort, although neglected.

Obſervations on Calp, by the Hon. George Knox, M.R.I.A.

"As the Academy has evinced a deſire to promote mineralogical enquiries in the county of Dublin, I take the liberty of ſubmitting to it the analyſis of a mineral, which abounds in the neighbourhood of the metropolis, and which our celebrated preſident has diſtinguiſhed by the name of Calp. (Vid Kirwan's Elements of Mineralogy, Vol. I. p. 233.)

Calp, or black quarry ſtone of Dublin, is placed, in Mr. Kirwan's Elements of Mineralogy, under the argillaceous genus; being a ſubſtance, which poſſeſſes the diſtinctive characters of that earth more than any other. For, although it effervesces with acids, and ſcratches glaſs, it neither burns to lime, nor gives fire with ſteel; whilſt on the other hand it emits, when breathed upon, the ſmell peculiar to argillaceous earth.

The quantity of argill, however, which its chemical analyſis diſcovers, would ſcarcely, were its internal properties to determine its claſs, entitle it to rank in that, which Mr. Kirwan has aſſigned to it.

The

The external characters and leading properties of the ſpecimen, which I uſed, were the following:

Colour—Greyiſh black, inclining to blue.

Luſtre—o

Tranſparency—o

Hardneſs—Scratched glaſs with difficulty, crumbling at the ſame time.—Did not give fire with ſteel.

Fracture—Lateral fracture imperfectly conchoidal—Tranſverſe fracture ſlaty, paſſing into the coarſe-grained earthy.

Gave a white ſtreak.

Effervеſced with acids.

Gave an earthy ſmell when breathed on.

When calcined did not flake.

Colour, when calcined, a yellowiſh grey.

Cracked, and flew into thin ſlates, when expoſed to a low heat in an open fire.

Specific gravity, at the temperature of 66 Fahrenheit, 2. 68.

CHEMICAL ANALYSIS.

One hundred parts contain the following ſubſtances, in nearly the proportions annexed;

Carbonate of lime, - - -	68
Oxyd of iron, - - - -	2
Argill, - - - - -	7½
Silex, - - - - - -	18
Carbon and bitumen, - - -	3
Water, - - - - -	1½

The

The proceſs, by which a mineral ſubſtance, of the nature of that which is the ſubject of this paper, is analyſed, is ſo ſimple, and well known, as almoſt to render any detail of the operation unneceſſary. More than one analyſis was made; the muriatic and acetous acids were ſeverally uſed to take up the carbonate of lime; but the former diſſolved the iron alſo. The metal was precipitated from the muriatic ſolution by pruſſiate of pot-aſh, and the lime ſeparated from each by carbonate of potaſh. The argill was extricated with difficulty, by long digeſtion and boiling in ſulphuric acid, and precipitated by carbonate of ſoda.—Beſides the general analyſis, each ingredient was ſeparately collected from diſtinct portions, of an hundred grains each, of the ſpecimen.

The following are my reaſons for ſuppoſing, that the iron was in the ſtate of an oxyd, and that the principal colouring matter was compoſed of carbon and bitumen.

With a view of diſcovering, whether the iron was in its metallic ſtate, or otherwiſe, in the ſtone, a large quantity of it, amounting to ſeveral hundred grains, was treated with muriatic acid, and the gas, which was extricated, was paſſed through water, and caught in a pneumatic apparatus.

The ſame proceſs was repeated, with the ſubſtitution of the ſulphuric for the muriatic acid. In both caſes the

the reſult was the ſame; no hydrogen gas could be collected; but, when the whole of the carbonic acid had been imbibed by the water, there remained, in the veſſel, a ſmall quantity of azotic gas.

That the dark colour of the ſtone could not be produced merely by the oxyd of iron, I was naturally led to ſuſpect, from the change produced in it by calcination. I therefore ſatisfied myſelf on that point, by carefully ſeparating from a portion of the ſtone every particle of the metal, a proceſs which produced no change in its colour.

As it appeared now pretty evident, that the calp contained ſome inflammable matter, to which it was indebted for its dark colour, I endeavoured to eſtimate its proportion by the following proceſs:

Thirty grains, from which all the carbonate of lime and oxyd of iron had been previouſly extracted, were dried in a cloſe veſſel, and in ſuch a heat as ſeemed ſufficient to expel the water, and afterwards calcined. By the calcination the powder was rendered white, and loſt that proportion of its weight, which I aſſign, in the reſult of the analyſis, to the carbon and bitumen.

Still, however, it remained to determine in what ſtate, whether of carbon or of bitumen ſingly, or whether of a mixture of both, the inflammable colouring matter exiſted in the mineral.

On

On the ſuppoſition, that it was merely carbon in a ſtate of extreme diviſion, it was boiled (the lime, argill, and iron having been previouſly ſeparated) in concentrated nitrous acid. By this treatment the intenſity of the colour was ſomewhat diminiſhed, and a ſmall quantity of nitrous air was produced.

The next attempt was to ſeparate the bitumen, ſuppoſing that it contained any. To effect this, a large quantity of the powdered calp was boiled in cauſtic pot-aſh, filtered, and edulcorated; but as the reſiduum on the filtre retained the original colour, it conſequently could not have been entirely produced by bituminous matter.

That it contained, however, *ſome* bitumen, ſeems pretty evident; for, having evaporated the filtered ſolution to dryneſs, and diſſolved the dried reſiduum in muriatic acid, an oily matter floated on the ſurface of the liquor.

From theſe experiments I have ventured to aſſert, that the colouring matter is compoſed, in proportions which I have not been able to aſcertain, of a mixture of bitumen and carbon.

With reſpect to the azot, I am unable to form any ſatisfactory conjectures on its origin. Might it not have proceeded from the body of the animal, whoſe ſhell had contributed the carbonate of lime to the formation of the maſs?

The

The following facts may aſſiſt enquiries upon this ſubject:

Calp is found in great quantities in the neighbourhood of Lucan; and the quarries, from which it is dug, generally exhibit the following appearance:

Immediately under the vegetable mould is a thin bed of limeſtone-gravel; beneath which, to a conſiderable depth, are ſtrata of dark limeſtone, ſeparated from each other by beds or layers of argillaceous ſhiſtus. The deeper the quarry is dug, the nearer the limeſtone ſeems to approach to the nature of calp; to which it at length arrives, by a gradual and ſcarcely perceptible tranſition.

In the grounds of Edmondſbury, ſcarcely one mile from Lucan, there is a ſpring, called by the common people the boiling well, which is of a ſomewhat higher temperature than the neighbouring ſprings, and from the bottom of which are continually riſing large bubbles of pure azotic gas.

In an analyſis, which I ſometime ſince attempted, of the Lucan water, I found that azotic as well as hydrogen gas eſcaped from it at a boiling heat; a circumſtance, which could hardly have been occaſioned by the decompoſition of atmoſpheric air held in ſolution in the water, as no ſulphuric or ſulphureous acid was produced, as was to be expected from the ſimultaneous decompoſition of ſulphurated hydrogen gas and atmoſpheric air.

It may alſo be worth obſerving, by perſons who are deſirous of proſecuting this enquiry farther, that in moſt of the limeſtone in that neighbourhood, which contains ſhells, is to be found ſulphurated hydrogen. And likewiſe that, after evaporating the Lucan water to dryneſs, a ſmall quantity of a fetid bituminous matter, ſoluble in alcohol, remains mixed with the earths and ſalts.

On theſe few facts I ſhall not preſume to form a theory; neither do I offer them as ſubjects for ſpeculation, but as an encouragement to further and more accurate reſearches.

Note.—As I believe, that my analyſis of the Lucan water is a nearer approximation to the truth than any hitherto publiſhed, and perhaps ſufficiently accurate for medical purpoſes, I ſhall here ſubjoin it. To thoſe, who are acquainted with the difficulties attending the inveſtigation of the ingredients of an hepatic water, it will not afford any ſurpriſe, that I ſhould offer the reſult of mine with diffidence.

LUCAN WATER, TWO GALLONS.

	GRAINS.
Carbonate of magneſia,	1½
Carbonate of lime,	23
Carbonate of ſoda,	39
Muriate of ſoda,	4
Sulphur,	16
Bitumen,	

The

The carbonate of lime is held in ſolution by an exceſs of carbonic acid, amounting to about 32 cubic inches in two gallons of the water. The ſulphur is in the ſtate of ſulphurated hydrogen."

Of Flints, and other Stones akin to them.

Our ſhores, particularly from Laughlinſtown to Bray, abound with pebbles of all colours, and often beautifully variegated, ſo that they might contend with the Egyptian. They all ſtrike fire with ſteel, and cauſe no ebullition with acids. They bear the poliſh, and ſerve for making the tops of ſnuff-boxes, ſeals, heads of canes, ſleeve-buttons, and handles of knives.

Of Porphyry.

We find in ſeveral places, even in the neighbourhood of Dublin, ſtones which very nearly correſpond to the characters of porphyry; particularly on the Hill of Howth are large rocks, white and red, ſhining like marble, and to a ſuperficial view appearing like white and red marble, bearing a natural poliſh (as the red one did an artificial), but much harder than marble, for this ſtone cut an iron peſtle when ſtruck

on it, nor did it bear the saw: it struck fire copiously with steel, and smelt sulphureous on collision. It made only a just sensible ebullition with oil of vitriol; scarce any with spirit of salt or aquafortis. Kept ten hours in a pipe-maker's furnace, it was not softened, but harder, and still struck fire with steel.

On Ireland's Eye are found more rocks of the same kind of stone, having a natural polish, breaking opaque and purple, and of several colours, and, when kept ten hours in a reverbatory furnace, it was still hard, although more brittle, but still struck fire with steel.

Of the Granite, vulgarly called Firestone.

The granites* are stones composed of separate and very large concretions, rudely compacted together, giving fire with steel, not fermenting with acids, and slowly and imperfectly calcinable in a large fire.† Now our firestone agrees almost in every particular (except in bearing a polish, which ours does not, save in its shining from the great quantity of mica, with which some of these abound) to the *Granita alba durissima nigro-variegata, quæ incolis Cornubiensibus*, Moore-stone of the same author, who affirms, that a strict analysis and

* Hill's History of Fossils.

† Tournefort, in his voyage to the Levant, calls the granite a white or greyish marble, naturally petrified together with small pieces of talc, and that almost all the islands in the Archipelago are covered with this granite.

and examination of theſe ſtones ſhew them to be a mixture of pure mica, true cryſtal, and an earth not unlike field-ſpar; and he ſays that it is found in immenſe ſtrata in ſome parts of Ireland, but is diſregarded there, and never brought into uſe; but this, with divers other improvements, within theſe thirty years is introduced, and greatly uſed and eſteemed in our buildings in the city of Dublin (in the neighbourhood of which it abounds, even in almoſt all the mountains to the * ſouth, extending to the neighbouring counties of Wicklow and Wexford), inſomuch as to have in ſome meaſure ſupplanted the uſe of Portland-ſtone; for though it is not capable of being cut into the finer figures of architecture as that, yet it may be cut into any ſhape, and bears the weather better. It is cut at the quarry (where it is ſofter, but hardens in the air) into all ſhapes by the chizel, mallet, and hammer (like the freeſtone, than which it is harder), as into window-jaumbs, ſtools of windows, lintens and jaumbs of doors, pillars, troughs, mortars, and chimney-pieces. The ſpire of the preſent ſteeple of St. Patrick, in Dublin, is built of it, and part of Eſſex-bridge, and the piers of Wicklow, and at Dunleary.

* Near Dunleary and Bullock ſome of theſe ſtones have been found, which bear a poliſh (being cut with emery), but not a beautiful one; they are building their piers at Dunleary with it.

Of

Of Mill-ſtones.

THESE demand a diſtinct conſideration from the foregoing ſtones; thoſe, which occurred to me in this county, were for the moſt part red, and contained ſome portion of ferruginous matter; being altogether diſtinct from the *ſaxum arenarium, lapis molaris dictum cos molaris* of Walerius, which has ſpar combined, and ſometimes effervesces with acids, which ours does not, or but little. A ſpecimen of ours, found on the ſhore between Raheny and Malahide, being powdered, fled to the magnet ſwiftly, and is one of the *lithozugia* or pudding-ſtones,* in Hill's Hiſtory of Foſſils, p. 557, who ſays it is uſed in ſome parts of England for cutting into ſnuff-boxes and other ſuch toys; and indeed ſome of theſe are naturally poliſhed.

And in a glyn called Millſtone-glyn, between Rathfarnham and Carrickmayne, is a ſtone like the preceding, being a petrification of gravel, iron-ſtone, &c. Of this one ounce, two drachms, and fifty grains, kept eleven hours in a naked coal-fire, loſt ſcarce one grain, but ſtill retained its hardneſs, and ſtruck fire with ſteel.

On

* In Cronſtedt's Syſtem of Mineralogy, it is called *Saxum ſilicibus amorphis materia Jaſpidea conglutinatis, Anglice, plumb-pudding-ſtone.*

On Ireland's Eye, and on the road between Newcaſtle and Rathcool, is a red ſtone of the ſame kind.

On the lands of Donnabate are large rocks called millſtones, conſiſting of pebbles and flint cemented together, of various colours, red and pale, and which ſtruck fire with ſteel, and made no ebullition with ſpirit of vitriol.

N. B. Thomas Covey, an ingenious architect, has made ſome remarks on ſome of theſe ſtones in the county of Wexford, which I ſhall inſert in his own words. "They poole or cleave theſe rocks with wedges, and bring them to the form of millſtones, with picks and pick-hammers (for no chizel will cut them), and they are very ſound, and grind corn clean and well; and I have known good walls to have been built of this ſtone; for they dreſs tolerably well with the hammer, and bind hard in their mortar."

Of Lead Ore.

In a manuſcript in the College library, is the following paragraph: "In the city of Dublin, between New-row and New-ſtreet, as you go to Roper's-reſt, within ſixty yards of the river, is a lead-mine, poor in ſilver, but yielding one ounce of lead from three of the ore, as John Powel, a miner, found upon a trial of it, made at the requeſt of Sir George Hamilton."

Lead

Lead ore has been found at the quarry near Stephen's-green, on the road to the Black-rock, being on the eaſt ſide of the city; and at old Jones's quarry at Dolphin's-barn, being the weſt ſide; half an ounce whereof, being fluxed with equal parts of potaſhes, gave a drachm and a half of pure lead.

This quarry was formerly wrought upon, and a ſmelting furnace was erected in the neighbourhood.

And at another quarry adjoining the Commons of Kilmainham, called Fleming's quarry, higher up the road than Jones's quarry, there were raiſed, in the years 1767 and 1768, in the ſpace of about eighteen months, ſixty or ſeventy tons of lead ore, which yielded about twelve hundred of lead from each ton of ore, and about twenty-four ounces of ſilver from each ton of lead: the workmen wrought here to the depth of about thirty yards; but, as the ore raiſed at this depth came too dear, on account of the great expence of keeping the work free of water, it was dropped.—There are two or three veins of lead ore in the quarry, all of them ſeeming to take their courſe into the ſaid commons; upon one of theſe veins in the commons, ſome miners in the year 1769 were at work, and raiſed upwards of ten tons of ore, which they diſpoſed of, when waſhed, to thoſe who ſmelt it, and the workmen made good wages; they found it within three feet of the ſurface of the ground, and did not work deeper than about twenty-eight feet, on account

of

of the obſtruction by water. It is ſuppoſed, that the ore they then raiſed would produce the ſame quantity of lead and ſilver, as the ore raiſed in Fleming's quarry above. One of theſe veins ſeems to take its courſe acroſs the road to Andrews's houſe, near the wall of the court of the ſaid houſe, where the ore has appeared, and probably takes its courſe towards the mountains.

I am informed that, unleſs lead will produce thirteen ounces of ſilver in the ton of lead, it won't bear the coſt of refining, the loſs of lead being from two to three hundred weight in the operation. Lead ore has been alſo found at Kilmainham, being probably a continuation of the ſame vein from Dolphin's-barn. And in the deer-park near Caſtleknock, there was found lead ore and copper ore; and alſo near the old caſtle of Caſtleknock, and north-eaſt from it, there was a lead-mine opened in the year 1744, by Edward Ford, Eſq. and on ſome of the ſtones were green ſpots, indicating a mixture of copper. Likewiſe at or near Dubber, and at Dunſink, is found both lead and copper ore, and ſome very rich ore at Cloghran's church, where two mines were formerly wrought upon, but the work was dropped.

Near Rob's-walls, in the rocks, lead ore is ſeen diſpoſed in ramifications; and cryſtals reſembling Kerry ſtones are found there, which is an encouragement to make a ſearch there. Alſo, lead ore is found on the

Hill of Howth, and a vein of it on the ſhore, about midway between Lord Howth's houſe and the Light-houſe.

On the North ſtrand, almoſt oppoſite to an old quarry near Clontarf town, are two or three veins of lead ore; one whereof, at the diſtance of about eighty yards from the ſhore, was wrought upon in the year 1768, by ſome miners, who raiſed there upwards of fourteen tons of ore, which afforded them good wages. On the ſurface appeared a kind of yellowiſh ochre; they would not ſink deeper than about thirty feet, nor could they make large openings, as their pits were filled every tide with the ſea-water, which they were obliged to pump and lade out, ſo that they could not work at raiſing the ore more than two or three hours every tide; this ore produced, when ſmelted, about twelve hundred of lead in each ton of ore; and ſome ſilver was found in the lead upon aſſaying it, but not worth refining.

A lead courſe near Crab-lough, was formerly wrought upon by Captain Vernon, whoſe eſtate it was; but he deſiſted working it, as it did not anſwer his expectations.

I am informed that, on the eſtate of Lord Fitzwilliam, under Lady Arabella Denny's garden, a vein of lead ore hath lately been obſerved, of ſome inches thick, by Patrick Hyland, miner.

Near

Near Dalkey is a lead mine, where it is ſaid that ſome hundred tons of ore have been raiſed. I got forty-two grains of lead from ninety grains of it, fluxed with equal parts of ſalt of tartar.

In Killeny Bay, on the eſtate of John Malpas, Eſq. a work was begun in the year 1751; the ore was ſaid to be rich, and to contain a conſiderable quantity of ſilver.

On the demeſnes of St. Catharine's, a lead vein was diſcovered, and formerly wrought upon for a ſhort time by the owner, Sir Samuel Cooke.

Upon ſome lands belonging to the city of Dublin, near Hunt's-town, and adjoining to the public road, leading from Dublin to Ratoath, by the way of Cardiff's-bridge, there appears a lead vein, which has not yet been wrought upon, though it ſeems to give a promiſing proſpect.

Copper Ore,

Occurs not unfrequently in this county; but though ſome attempts have been made in raiſing it, nothing of moment hitherto has been done.

Near the river, about a mile weſt from Knockmaroon-hill, is a vein of copper ore.

At or near Dubber is a yellow, green, and ſhining copper ore.

No. 10. & 11. From the banks of the river Dodder at Rathfarnham-bridge; ſtill finer grained, with cryſtals of ſhorl.

12. Remarkably fine-grained granite, with garnets and hornſtone, the latter being of a pearly grey colour; from the fields of Oden, near Rathfarnham.

13. Fine-grained granite, paſſing into white quartz, from the mountains of Shankill, beyond Ballynaſcorney.

14. Ditto, ditto, ditto.

15. Granite, of an ochre-yellow colour, found near Dalkey, with a vein of very fine white-grained granite paſſing through it.

16. A finer ſpecimen of ditto, from the ſame place.

17. Gneiſs, or ſtratified granite, from Kilmacud.

18. One of ditto, almoſt ſlaty, from Carrickmines-hill.

19. Micaceous ſhiſtus, with veins of fine-grained granite paſſing through it, from Ballynaſcorney.

20. A ſpecimen of coarſe-grained granite, from the mines near Dalkey.

21. A ſpecimen of very pure white foliated baroſelenite; a vein of which paſſes through the granite at Dalkey, and reſembles in colour and luſtre the felſpar of the ſpecimen No. 20.

22. A large maſs of the baroſelenite, to ſhew the thickneſs of the vein; the ſurfaces, which were in contact with the granite, are covered with mica.

23. One of ditto, ditto, from the ſame place.

No.

No. 24. Coarſe-grained porcelain rock, from the mines at Dalkey.

25. A finer-grained ſpecimen of ditto.

26. Much finer-grained ditto.

27. Remarkably fine-grained ditto.

28. In the ſtate of coarſe powder.

29. Some of the porcelain powder or kaolin, waſhed and ſeparated from the grains of quartz &c.

30. Pearl-grey-coloured hornſtone from the ſame place.

31. Porcelain rock, with vains of hornſtone paſſing through it; the hornſtone approaches nearly to calcedony.

32. Hornſtone curiouſly cryſtallized, with galena do.

33. A more perfect ſpecimen of do. do.; this ſpecimen approaches very near to calcedony.

34. Ditto, ditto, ditto, with martial pyrites and browniſh blende.

35. A ſpecimen of ſteel-grained lead ore from the ſame place.

36. A ſpecimen of granitell, conſiſting of white quartz and hornblende, from Shankill, beyond Ballynaſcorney.

37. Bluiſh grey compact limeſtone, with yellowiſh white calcareous ſpar, and yellow blende, from the quarries near Milltown.

38. Ditto, ditto, with veins of white calcareous ſpar, from the great quarries near Clonſkeagh bridge.

39. Ditto,

No. 39. Ditto, ditto, beautifully veined with very white calcareous ſpar, from the quarries on the banks of the Royal canal, near Kirkpatrick bridge.

40. Ditto, ditto, with vermiform impreſſions from the ſame place; this ſpecies of petrifaction I believe is peculiar to Ireland; I have obſerved it on the ſea ſhore at Howth, and alſo amongſt the Kilkenny marble.

41. One of ditto from the ſame place, with yellow blende.

42. One of ditto from ditto much leſs compact; the vermiform impreſſions, being white, are beautifully diſtinct.

43. Light-grey compact limeſtone, with a narrow vein of baſanite, or the lydian ſtone of Werner, paſſing through it, of a greyiſh black colour, from the quarries at Milltown.

44. One of ditto ditto, with a larger vein of baſanite and illinitions of white quartz, from the ſame place.

45. One of ditto ditto, with a much larger vein of baſanite paſſing through it, and interſected with veins of white quartz, from ditto.

46. Light grey limeſtone, with a large vein of baſanite, from the banks of the river Dodder near Rathfarnham.

47. Ditto ditto, with a pentagonal maſs of baſanite adhering to it, from ditto.

48. A

48. A maſs of baſanite of an hexagonal figure, interſected with veins of an ochre-yellow calcareous earth, from ditto.

49. Baſanite of a ſlaty nature, interſected with numerous veins of yellowiſh calcareous earth, from do.

50. An argillaceous ſand-ſtone, ſurrounded with thin veins of baſanite from Ballynaſcorney.

51. Remarkably white calcareous ſpar, intermixed with bluiſh-grey compact limeſtone, from the quarries near Kirkpatrick-bridge, Royal canal.

52. Yellowiſh white calcareous ſpar, from the ſame place, which, if placed on a hot iron, becomes beautifully luminous in the dark.

53. Honey-yellow ſtriated calcareous ſpar; the ſtriæ diverging from a common centre, and terminating in rhombs, with granular limeſtone from the ſame place.

54. One of ditto, ditto, the ſtriæ terminating in much larger rhombs, from ditto.

55. Yellowiſh white calcareous ſpar, with rhomboidal cryſtals, very uncommon, from the ſame place.

56. White ſtriated calcareous ſpar, the ſtriæ of which are nearly parallel, very uncommon, from the gravel-pits at Borenebreene.

57. Fleſh-red calcareous ſpar, with bluiſh-grey limeſtone, from a quarry near the twelfth lock, Royal canal.

No. 58. Singularly accumulated rhomboidal cryſtals of ditto, of an Iſabella yellow, in a nodule of ſidero-calcite or pearl-ſpar, from the Royal canal, Kirkpatrick-bridge.

59. Bituminous marlite, with a conſiderable appearance of compact bitumen and martial pyrites, from the parapet-wall, at the left hand ſide, near the Pigeon-houſe. As ſeveral of theſe ſtones are in the wall alluded to, it might be of conſiderable conſequence to diſcover where they were quarried.

60. A compact ſpecimen of ſidero-calcite, of a reddiſh white colour, from near Kirkpatrick-bridge, Royal canal.

61. A leſs compact ſpecimen of ditto, with calcareous ſpar, from ditto.

62. A remarkably fine ſpecimen of compact ſidero-calcite, of a reddiſh white colour, with uncommonly large lenticular cryſtals of ditto, from ditto.

63. A group of ſmaller lenticular cryſtals of ditto, of a browniſh yellow colour; their luſtre metallic, and intermixed with bluiſh grey compact limeſtone; from ditto.

64. A ſpecimen of ditto, ditto, with ſmaller cryſtals.

65. Ditto, ditto, of a pearly white colour, from ditto; very rare at this place.

66. A ſpecimen of ditto; the colour of the cryſtals leſs white, with honey-yellow calcareous ſpar, and light-grey limeſtone; from ditto.

No.

No. 67. Very ſmall cryſtals of ditto, nearly rhomboidal, of a browniſh yellow colour, cellular, and intermixed with bluiſh grey compact limeſtone; from ditto.

68. General appearance of the cryſtals of ditto, intermixed with calcareous cryſtals.

69. An uncommon maſs of ditto, with calcareous cryſtals of a wine-yellow colour, from ditto.

70. Sidero-calcite, calcareous cryſtals, and iron ochre.

71. Ditto, with ſmall lenticular calcareous cryſtals, and bluiſh grey limeſtone.

72. Ditto, intermixed with white calcareous ſpar, ſiliceous cryſtals, and a cryſtal of purple fluor, on bluiſh grey limeſtone, from ditto.

73. A vein of ſidero-calcite, paſſing through dark grey limeſtone; from the quarries at Dolphin's-barn.

74. A ſpecimen of ſidero-calcite, from Sligo.

75. Ditto, ditto, with light-grey limeſtone; great maſſes of which I obſerved near the marble-mills in the county of Kilkenny, in the year 1797.

76. A cryſtal of purple fluor, imbedded in white calcareous ſpar, on compact limeſtone, with yellow blende, from near Nevill-bridge, Royal canal.

77. Light ſmoke-grey cryſtallized quartz, with white ditto, and partly coated with yellow iron ochre; from near Kirkpatrick-bridge, ditto.

78. Cellular quartz, with cryſtals of quartz and malachite; from ditto.

No. 79. Round, cellular, or nearly reniform quartz, with cryſtals of ditto, from the ſame place: the under ſurface of this ſpecimen is uncommonly criſtated.

80. Small reniform cryſtals of white quartz, on hornſtone; from ditto.

81. A druſy of quartz cryſtals, in ſome places radiating from a common centre, on a baſis apparently of tripoli; of a pale yellowiſh grey colour, with petrifactions; from ditto.

82. Very white quartz, cryſtallized in hexangular priſms, ſurmounted at both ends with hexagonal pyramids; the priſms appear as if ſprinkled over with minute cryſtals of ditto, and arranged on cellular quartz; from ditto.

83. Yellow cryſtals of quartz, on hornſtone, very uncommon, from ditto.

84. White quartz, with copper pyrites, fibrous malachite, and iron ochre, from near Neville-bridge, ditto.

85. Tolerably rich copper pyrites, and fibrous malachite, from ditto.

86. & 87. Indeterminate maſſes of white quartz, very common on the banks of the river Dodder, which, when rubbed together, emits light, even under water.

88. A porphyry, from Bray ſhore, with a baſis apparently of clove-brown jaſper, with greeniſh felſpar.

No.

No. 89. An argillaceous porphyry, with a baſis of dark-green hornblende, paſſing into greeniſh actynolite, with ſome adhering quartz; colour of the felſpar yellowiſh; from the brakes of Ballynaſcorney

90. Shiſtoſe mica, of an undulating fracture, very beautiful; from ditto.

91. Part of the ſame ſpecimen, ſplit in a different place where the fracture is leſs undulating.

92. A ſpecimen of ditto, ditto, of a ſilvery grey colour, from ditto.

93. Ditto, ditto, ditto; its fracture ſtraight foliated.

94. One of ditto, ditto; its luſtre almoſt pearly; from ditto.

95. A very uncommon ſhiſtoſe mica, from the ſhore at Killiney Bay; it appears ſtellated: part of the mountains in that neighbourhood are formed of it, which ſhall afterwards be noticed.

96. Shiſtoſe mica, paſſing into chlorite, and curiouſly interſected with veins of quartz; from the brakes of Ballynaſcorney.

97. Iron-ſtone, intermixed with iron ochre, from near Neville-bridge.

98. An uncommon maſs of cellular iron-ſtone, partly brown, and partly ochre-yellow; from ditto.

99. A ſpecimen ſomewhat ſimilar of ditto.

100. A ſpecimen of ditto, ditto, one of the cells of which is filled by infiltration with ſiliceous cryſtals.

A LIST

A LIST

OF

ARTICLES DEPENDANT ON AGRICULTURE,

Imported into Ireland within the last seven years.

	Apples.	Aſhes.			Beans & Peas.	Oats.
	Buſhels.	*cwt.*	*qr.*	*lb.*	*Buſhels.*	*Barrels.*
1795,	1830½	88,709	3		1615	559
1796,	536	172,513	1		1908	—
1797,	2780	106,549	3	7	1434½	261
1798,	361¼	54,974			1052	17
1799,	23	117,243	1		1299	28
1800,	527	159,580	3	14	1407½	40
1801,	2897	110,689			1565¾	816½

	Barley & Malt.	Wheat.	Flax-ſeed.	Hemp-ſeed.
	Barrels.	*Barrels.*	*Hhds.*	*Hhds.*
1795,	—	96,294	46924	—
1796,	26	13	25052	114
1797,	7056	155	42796	104
1798,	52	611	36009	104
1799,	3237	85	40387	134½
1800,	44898	18,588	64547	131
1801,	288½	42,994	33862	152¾

	Hops.			Flour.			Garden-ſeeds.	Graſs-ſeeds.		
	cwt.	*qr.*	*lb.*	*cwt.*	*qr.*	*lb.*	*lb.*	*cwt.*	*qr.*	*lb.*
1795,	18,340	1		11,496			58295	890	3	7
1796,	18,175	2	21	—			47788	1161	3	14
1797,	12,606			—			40185	1482	2	21
1798,	25,054			—			40445	1597	2	7
1799,	11,693	2	14	—			33894	235	1	7
1800,	9,998			360	3	14	43780	361	2	14
1801,	9,759	2		42,352			51144	399	2	14

Starch:

	Starch.	Tallow.	Spaniſh Wool.	Worſted Yarn.	Clover.
	cwt. qr. lb.	*cwt. qr. lb.*	*cwt. qr. lb.*	*lb.*	*cwt. qr. lb.*
1795,	——	4913 2 7	362 0 14	1472	4413 1 14
1796,	177 2 21	6864 2	215 3 7	525	1765 0 0
1797,	131 1 14	12757 3 21	230 1 14	1440	3125 3 0
1798,	11	2240 1	221 0 0	990	3540 3 0
1799,	79 3 14	7758	244 3 0	2213	3201 3 0
1800,	125 2	9259	758 3 14	2438	3205 2 14
1801,	2107 2 14	19441	683 3 0	1935	2688 0 0

In the article of clover-ſeed I am not a little ſurpriſed to find a decreaſe in the quantity imported; for in the ſeven years, ending 1770, the average was 3349 cwt.; in the next ſeven years, the average was 3927 cwt.; but in the ſeven years ending 1801, the average is only 3134 cwt. If a large quantity has not been ſaved in Ireland, it helps to prove, that we have not improved in our ſyſtem of cropping. Though our Statiſtical Reports are generally ſilent on this head, there certainly has been ſome ſaved, but I fear not enough to account for the defalcation in the imports.

In many places, where clover has been ſowed, it has not been as part of a courſe, but merely as a random crop for ſoiling or (too often) for grazing: even in this mode its ineſtimable value ought long ſince to have brought it into general uſe. Whatever prejudice may dictate, it will be found, that ſcarcely any article in the liſt cannot be produced in Ireland in great perfection.

It

It will be a difficult matter to aſcertain the quantity of clover imported ſince the duties were taken off, as I underſtand it has become a practice with ſome importers, from a ridiculous oſtentation, to enter a much greater quantity than they really import, which may help to miſlead in any future calculations.

IRRIGATION.

IRRIGATION,

BY MEANS OF WARPING.

THE following extract from Mr. Tatham's Treatiſe on National Irrigation, will, I hope, be deemed worth attention, as we poſſeſs vaſt tracts of ground in many parts of Ireland, that are capable of this improvement, particularly that great tract of ſtrand between the Light-houſe and Booterſtown, and between the ſame Light-houſe and Clontarf. I have frequently viewed theſe two ſtrands, and am perfectly well convinced they could be eaſily reclaimed, and made capable of admitting the improvement ſuggeſted in the following extract. If Lord Fitzwilliam or Mr. Vernon were ſenſible of the eaſe, with which this could be executed, and the great addition it would make to their income, I imagine the ſuggeſtions of thoſe unacquainted with ſuch affairs would have little weight; for the ſneers of ignorance have often prevented many improvements from being adopted, or even propoſed, and may juſtly be added to the liſt of obſtacles to the improvement of waſte land. I have frequently pointed out the practicability of this improvement, and have been anſwered, more than once, that 100,000*l.* would not build a wall ſufficiently ſtrong to keep out the ſea. I heſitate not

to declare that, except for a ſluice, *a ſingle ſtone is not wanting*; and alſo that, if this idea had been originally adopted, the Ballaſt-office wall, that coſt ſuch immenſe ſums, need not have been erected, and the greater part of the ſtrand might have been long ſince in meadow, which would have added ſome thouſands a year to Lord Fitzwilliam's and Mr. Vernon's rent-roll.

"The word *warping* is applied in agriculture to deſcribe that ſpecies of irrigation, which depoſits a quantity of ſediment from the flowing tide, and which forms a ſtratum of ſoil or manure, when the waters have receded from it. This definition of the word appears to be chiefly limited to tide-water flowing from the ſea; though the nature of the accumulation ſeems to be nearly the ſame with the ſiltage of freſh-water rivers, the redundancy of which, by way of diſtinction, is called flooding.

"The method recommended by Lord Hawke in the Agricultural Survey of Yorkſhire (Weſt riding), p. 164, is, to bank the land, which is to be warped, againſt the river; ſloping the banks on each ſide of their crown or top, at the rate of three feet to every one foot perpendicular riſe. The height and breadth of the top will, of courſe, be regulated by the ſtrength of the tide, and depth of the water; for the object is to command the land and water at pleaſure. The openings or ſluices in the banks are in a ſmaller or greater number,

number, according to the extent of the land to be warped, and the fancy of the proprietor; but in general there are only two ſluices; one called the *floodgate*, to admit; and the other called the *clough*, to let off the water gently. Theſe, Lord Hawke ſays, are enough for ten or fifteen acres.

" When the ſpring tide begins to ebb, the floodgate is opened to admit the tide; the clough having been previouſly ſhut by the weight of water brought up the river by the flow of the tide. As the tide ebbs down the river, the weight or preſſure of the water being taken from the outſide of the clough next the river, the tide-water, that has been previouſly admitted by the floodgate, opens the clough again, and diſcharges itſelf ſlowly, but completely through it. The cloughs are ſo conſtructed as to let the water run off, between the ebb of the tide admitted, and the flow of the next; and to this point particular attention is paid. The floodgates are placed ſo high as only to let in the ſpring tides when opened; they are placed above the level of the common tides.

" The expence of warping will be greatly influenced by the ſituation of the lands, and the courſe and diſtance, which the warp is to be conducted. The expence per acre will depend greatly on the extent of land, which may be overflowed by one and the ſame ſet of drains and cloughs. Mr. Day, of Doncaſter, thinks

that great quantities of land may be warped at ſo ſmall an expence as from four to eight pounds per acre; and he ſtates the advantages gained at various rates, from five to fifty pounds per acre; and conſiders the greateſt advantage to ariſe from warping the worſt and moſt porous land.

"In enumerating the advantages, that accrue from warping, Mr. Day ſays, the land will bring very large crops for ſeveral years afterwards without any further manure; and that warping may be eaſily repeated at a ſmall expence, by opening old drains, which may ſerve in the interim for draining the land, if it ſhould be neceſſary. He recommends the culture of oats for the firſt crop after warping; and thinks this practice better adapted to oats, wheat, or beans, than to barley; which laſt is rendered too ſtrong and coarſe by the great fertility of the ſoil. He recommends, however, a coat of warp, whenever the land is fallowed; and conſiders this management, above all other kinds, the cheapeſt, when properly applied.

"Mr. Day defines warp to be the ſediment left upon the land by flooding it with tide water. It ſeems to be the letting in water, where the tide flows, that is termed warping; letting in freſh water from a river, though by a ſimilar operation, would be called flooding, and not warping. The benefit derived from warp appears to reſt in the ſaline particles, and a greater depoſit

depoſit of ſediment than can be generally obtained from freſh-water floodings. He recommends June, July, and Auguſt as the beſt months for warping, becauſe at this ſeaſon the ſoil is in its drieſt ſtate, and, of courſe, the moſt ſuſceptible of thoſe impregnations and acquiſitions, which are received in the acts of abſorption and adheſion. He conſiders wet ſeaſons the leaſt proper for warping, becauſe the redundancy of freſh water, which becomes mixed with the muddy tide, muſt neceſſarily weaken the ſaturation, and render it leſs capable of depoſiting ſediment. Land thus manured is deemed to be the beſt for potatoes, and far the moſt productive. The depth of the water to be uſed for warping will vary according to the ſurface of the ſoil, nor is it material, that it ſhould be always at the ſame height, although it is well to retain a depth of three or four feet where the ſituation and embankments will admit of it.

"Mr. Young, in the Agricultural Survey of Lincoln, ſays; what the land is, intended to be warped, is not of the ſmalleſt conſequence; a bog, clay, ſand, peat, or a barn floor, all one; as the warp raiſes it in one ſummer from ſix to eighteen inches thick, and in hollows, or low places, two, three, or four feet, ſo as to leave the whole piece level. The firſt warping-works, which Mr. Young viewed, were at Morton ferry, where Mr. Harriſon, who ſhewed them, has a large concern

concern in a very great undertaking, no leſs than to warp 4,620 acres of commons, by means of an act of incloſure and drainage. They are attempting to warp four hundred acres in one piece, which is to be ſold *to pay the expence of doing all the reſt*, and they have been offered thirty ſhillings an acre rent for it, when finiſhed.

"The improvements by warping, which Mr. Webſter has made at Bankſide (which is within the county of York), merit particular attention. His farm contains 212 acres of land, all warped; it coſt him 11*l.* per acre, and he would not now take 70*l.* for it; he thinks it worth 80*l.* per acre generally, and ſome parts of it worth 100*l.* The whole expences of his improvements did not exceed 2,500*l.*, or 12*l.* per acre. A neighbour below him offers 5*l.* per acre for the uſe of his ſluice and main cut, to warp three hundred acres, which amounts to 1,500*l.* and reduces the expence of Mr. Webſter's works to 1,000*l.*; take it however at the higheſt, and ſay that the land coſt 11*l.* and the improvements 12*l.* per acre, making 23*l.*, and he will gain, by a ſale at 70*l.* per acre, 47*l.* per acre, or 9,964*l.* upon the operation.

"This gentleman has warped ſome land, which, before warping, was moorland, worth only 18*d.* per acre; but it is now as good as the beſt; ſome of it would let at 5*l.* per acre for flax and potatoes, and the whole at 50*s.*

"Mr.

"Mr. Webſter has alſo applied warping on ſtubbles in autumn, by way of manuring: the crops have been very great; of potatoes from 80 to 130 tubs per acre; each tub meaſuring thirty-ſix gallons, and ſelling at 3*s.* to 3*s.* 6*d.* per tub for the round kind, and at 5*s.* to 8*s.* per tub for the kidneys.

"Twenty acres, warped by this gentleman in 1794, could not be ploughed for oats in 1795; he therefore ſowed the oats on the freſh warp, and ſcuffled in the ſeeds by men drawing a ſcuffler, allowing nine men to a ſcuffle; three acres of this, meaſured ſeparately, afforded fourteen quarters one ſack per acre.

"Mr. Webſter alſo warped twelve acres of wheat ſtubble, and ſowed it with oats in April, which produced twelve quarters per acre; then wheat, thirty-ſix buſhels per acre; never leſs than thirty buſhels per acre.

"Six acres of beans, ſays Mr. Young, produced ninety buſhels per acre; and one acre, meaſured for a wager, went nine buſhels over this; theſe lands have produced 144 pods from one bean, on four ſtalks, and Tartarian oats ſeven feet high. One piece, warped in 1793, produced oats in 1794, at the rate of ſix quarters per acre. White clover and hay-ſeeds were ſown with them, mown twice the firſt year; the firſt cutting yielded three tons of hay per acre; the ſecond one ton; and after that an immenſe eddiſh (after-graſs).

"The

"The great beauty of this ſpecies of improvement ſeems to conſiſt, not only in the capacity of creating ſoil altogether, but alſo in the eaſe, with which land can always be reinſtated, or refreſhed at a ſmall expence. Flax produces on warp-land forty to fifty ſtone per acre.

"Warped lands, at Reevereſs, have ſold for 100*l.* per acre. Lord Beverley has ſix or ſeven ſluices going, and has warped three hundred acres in a year.

"Twenty-four thouſand pounds was, ſome time paſt, expended in making a canal from the river Trent, near Althorpe, to Thorne, &c. This is a navigable canal, of forty feet bottom, and deſigned for warping a vaſt extent of country. A branch to Crowle is laid out, and another from Thorne to the river Dun; theſe are for navigation; and on each ſide of the navigable canals are ſokage drains for relieving the overflowing waters of the country, and at other times admitting tide waters for the proceſs of warping. It is propoſed to make cuts *of twelve miles*, at right angles, for the purpoſe of *ſelling warp to the country*, and for delivering through ſluices on either ſide, as occaſion requires. *The price propoſed is from four to five pounds per acre.*"

I have thus ſelected what I conſidered would be moſt uſeful for my preſent purpoſe; but it muſt ſtrike any perſon acquainted with the ſituation of Merrion-ſtrand, that admitting the tide-water alone would be injurious,

injurious, as the ſea, after waſhing the ſand-banks of Arklow, &c. would depoſit little or nothing but a barren ſand; the improvement muſt begin by admitting the muddy water of the river Liffey and the river Dodder to depoſit their valuable contents; this, with alternate irrigation, would, in a few years, make theſe barren waſtes highly valuable.

CANALS.

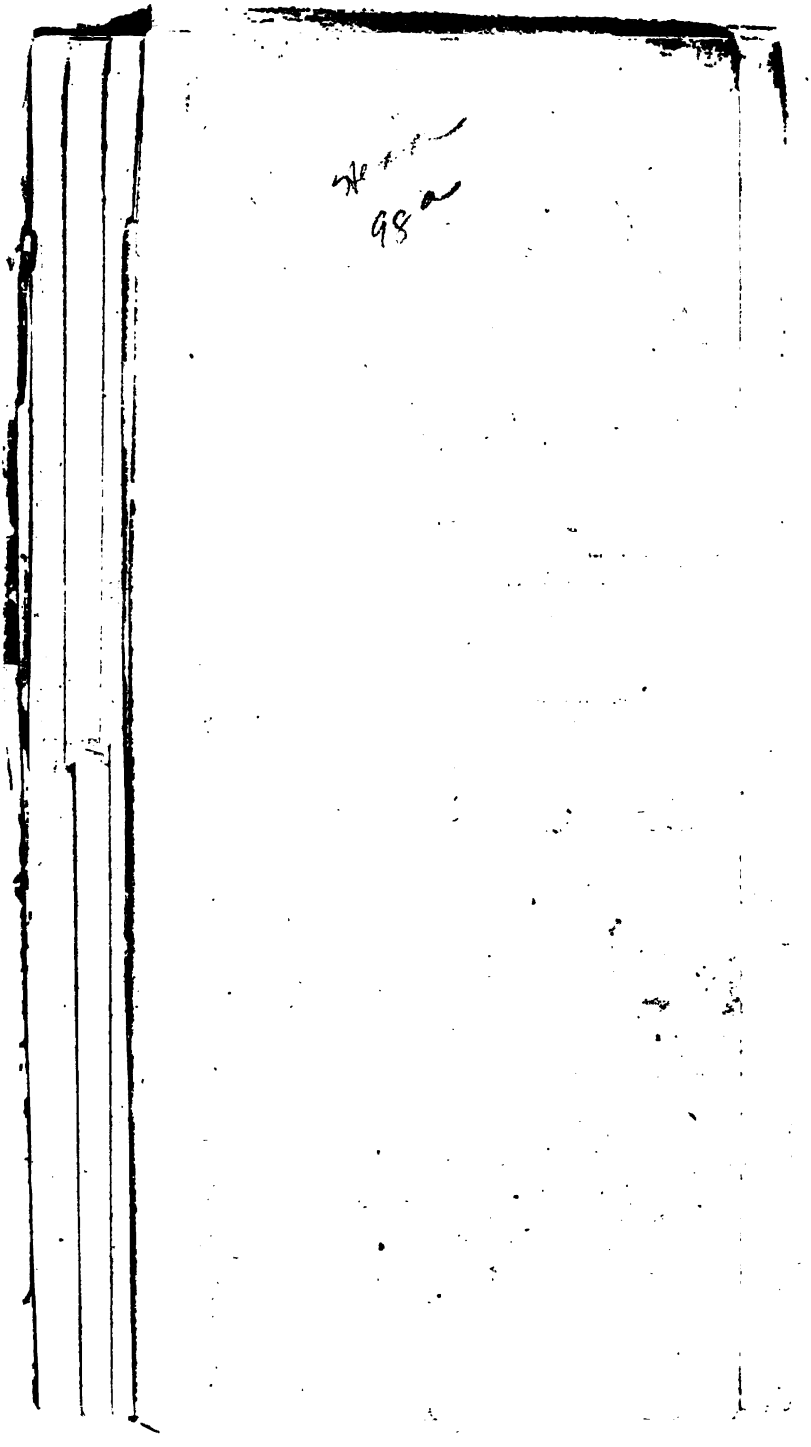
I am under great obligations to the Directors of the Grand and Royal Canals, for ſupplying me with ample materials, from which the following extracts are taken.— To Richard Griffith, Eſq. I am highly indebted for information, and in particular for the uſe of his Map of the Inland Navigations, hereunto annexed.

The origin and progreſs of the Grand Canal.

THE company of undertakers of the Grand Canal were incorporated in the year 1772, for the purpoſe of carrying on and completing a canal, already begun by the commiſſioners of inland navigation, from Dublin to the river Shannon, with off-branches to the rivers Barrow and Boyne, and were entitled, under the act of incorporation, to levy a toll of 3*d.* per ton per mile; a ſubſcription was entered into accordingly to the amount of £100,000, of which not more than £63,600 was received, and the ſhares, £36,400, of the defaulting ſubſcribers, were ſold at £40 per cent. which produced but £14,560.

The company then proceeded to carry on their canal, until their funds, by the above ſubſcriptions, were entirely expended. They then, (1783) made application

to



to Parliament for a loan of £50,000, and the prayer of their petition was granted by a reſolution of the Houſe of Commons; but a condition was annexed to the grant reducing the toll on the canal from 3*d.* to 1½*d.* per ton per mile, which condition the company, although then ſtruggling with the greateſt difficulties, refuſed to accept, and on the 23d December, 1783, raiſed the ſum of £50,000, at the rate of £50 per cent. The company afterwards borrowed ſeveral ſums of money, and iſſued debentures for the ſame, bearing an intereſt, ſome at four, and others at ſix per cent. and made various ſubſcriptions at ſeventy, one hundred, and one hundred and forty per cent. which ſums, ſo raiſed, together with about £116,000, which they have from time to time received in bounties from Government, they have expended on their works, making in the whole of ſtock and bounties upwards of one million ſterling.

The conſtitution and management.

The affairs of the company are managed by fifteen directors, annually appointed by the proprietors. In theſe directors are veſted all the powers of the company, except thoſe of alienating the tolls and revenues of the company, borrowing money, or commencing new works, until approved by the company.

The extent of the works executed.

A complete floating dock, capable of containing upwards of four hundred ſhips, with three large graving docks for the repairs thereof.

	miles.
Main trunk of the canal from ſaid docks, running round the circular road, and communicating with the canal in St. James's-ſtreet; extent - - - - -	3
Main trunk of the canal from St. James's-ſtreet, Dublin, to Lowtown common, to the Shannon and Barrow lines - - -	21
Continuation of the main trunk from Lowtown to Tullamore, within eighteen miles of the Shannon at Banagher, and at Athlone	23
Branch from the main trunk of the canal at Lowtown to the river Barrow at Athy -	21
Collateral branch on ſummit level to reſervoirs at Milltown - - -	7
Ditto at the Bog of Allen, with a reſervoir at Foranfan - - - -	3
	78
A canal from Tullamore, nearly completed to the river Shannon, near Banagher, -	18
Iriſh miles	96
Engliſh miles	122

The

The actual uſe of the works.

The principal commodities carried on the canal are flour, malt, wheat, oats and barley, turf, Kilkenny coal, timber, bricks, furniture, camp equipage, ordnance ſtores; the number of boats now employed, 412. The amount of freight in the laſt year, viz. 120,000 tons, are the beſt criterions of the actual uſe of the works.—Previous to the commencement of the rebellion, immenſe quantities of military ſtores were conveyed to the different parts of the kingdom by the canal, as far as Athy on one line, and as Tullamore on the other; and when the French landed at Killala, the Marquis Cornwallis embarked a conſiderable number of troops, with their baggage, camp equipage, and military ſtores, at Dublin and at Sallins, and proceeded with them to Tullamore, where they arrived on the following day, freſh, and fit to proceed on their march to Athlone; and it is to be obſerved, that this was the firſt trial made of the conveyance of large bodies of troops on the canal, for which ſufficient preparation had not been made; but ſo well ſatisfied was his Excellency of the expediency of this mode of conveying troops and military ſtores, that he ordered the Quarter-maſter-general to enter into a contract with the company, to provide and hold in readineſs a certain number of boats for the uſe of Government, which was accordingly

accordingly done for the ſum of £900 per month. A conſiderable reduction in the expence of travelling, by the cheap conveyance in paſſage boats, is another material advantage to the public, ariſing from the Grand Canal.—The arrangements made by the directors for the accommodation of paſſengers travelling in their boats, are admirably well calculated for convenience and œconomy. Three paſſage boats leave Dublin at different times every day, for Athy, Tullamore, and Robertſtown reſpectively, and the ſame number return daily to the metropolis from thoſe places. Hotels are eſtabliſhed at the above ſtations, excluſively, for the reception of paſſengers travelling in the boats, and the whole buſineſs is conducted on a ſyſtem ſuperior to any other eſtabliſhment of the kind in Great Britain, Holland, or any other part of Europe, the beneficial effects whereof are experienced by the company in a large and encreaſing revenue, and by the public in the accommodation of upwards of 130,000 paſſengers, who annually travel in the paſſage-boats.—The Barrow navigation company, purſuing the ſame wiſe and liberal ſyſtem above mentioned, have eſtabliſhed paſſage boats, which ply regularly between Athy, Carlow, Leighlin-bridge, and Gregnemanough, (a diſtance from the capital of 58 Iriſh miles) and convey paſſengers travelling in the Grand Canal paſſage boats to and from Athy.

There

There are 56 locks and 8 aqueducts on this canal and its branches, including its extenſion to Banagher. —The locks are 70 feet long, and 14 feet 6 inches wide.—The average fall of the locks is 9 feet. The ſummit level is well ſupplied with water—its height is 240 feet above the ſea. The depth of the canal is 5 feet over the cills of the locks and aqueducts, and 5 feet 6 inches in the body of the canal; it is 25 feet wide at bottom, and 40 feet wide at water ſurface.

The Revenues of the Company.

The revenues of the company have riſen in a gradual progreſſion in the laſt ſixteen years, ending 1ſt Auguſt 1802, from £.6,990 to £.47,100 per annum, viz:—

In 1787	6,984,	
1788	10,560,	
1789	11,770,	
1790	13,732,	
1791	14,818,	
1792	17,635,	
1793	18,062,	
1794	11,725,	—The canal was ſhut up for ſix months, in conſequence of its undergoing a general repair and ſome improvements.
1795	19,566,	
1796	23,636,	
1797	33,831,	—In conſequence of the corn bounties having been withdrawn in the laſt ſeſſion of parliament, the tolls did not encreaſe this year in their uſual proportion.
1798	19,518,	—This extraordinary decreaſe was produced by the rebellion, which broke out in May.
1799	29,796,	
1800	36,944,	
1801	42,524,	
1802	47,100,	

Extracts

Extracts of the quantity of COALS, TIMBER, *and* TURF, *paſſed on the Canal in the following years.*

	Tons of Coal.	*Tons of Timber.*	*Tons of Turf.*
1794 -	3,340 12 -	917 7 -	20,194 0
1795 -	3,070 1 -	1,242 16 -	22,195 15
1796 -	2,413 6 -	1,373 17 -	17,572 5
1797 -	2,032 2 -	568 5 -	18,000 0
1798 -	1,699 0 -	1,055 3 -	11,169 5
1799 -	3,027 9 -	2,443 15 -	16,205 0
1800 -	3,062 0 -	2,532 4 -	25,207 10
1801 -	2,532 15 -	3,338 18 -	29,278 18

When the canal to the Shannon near Banagher ſhall be opened, and the navigation of that river and of the Barrow completed, it is expected, that the revenues of the company will exceed £.100,000 per annum.

It was ſome time ago in the contemplation of Government to purchaſe the tolls of the Grand canal company (at leaſt on the neceſſaries of life) in order to encourage agriculture, and to afford ſome compenſation to the citizens of Dublin, as well as to the

farmers, millers, and malſters of Ireland, for the loſs of the bounties formerly paid on the carriage of corn to the capital, which bounties amounted annually to the ſum of £.90,000. This wiſe and beneficent plan, we underſtand, has been laid aſide, which muſt be a ſubject of deep regret to every friend to agriculture. The principle of reducing tolls has, however, been ſo far proſecuted in reſpect to corn tranſported on the rivers Shannon and Barrow, that the tolls on thoſe rivers are (in conſequence of bounties granted by Government) to be reduced to a very low rate. But the grand trunk, through which the capital is to be ſupplied with the neceſſaries of life from the fertile banks of thoſe rivers, remains loaded with a heavy toll of 3*d.* per ton, per mile, on all goods and merchandize whatever: and it cannot be expected, that the company, after having expended upwards of a million ſterling, ſhould relinquiſh the golden proſpects before them, without an adequate compenſation from the public.

The encreaſed demand for corn from Great Britain (which appears to be every year augmenting) on the one hand, and on the other the drain, which this country ſuſtains by abſentees, the remittances of the intereſt of our public loans, with the unfavourable balance of trade againſt Ireland, makes it imperative on Government to encourage and extend the agriculture of this country, in order to ſupply the demand for corn in Britain, and to counteract the injurious effects

effects above alluded to. This matter is ſo clearly ſtated in a ſhort work lately publiſhed by a gentleman of ſuperior talents that, with his permiſſion, we take the liberty of making a few extracts from it.

" Another reaſon, why the increaſe of tillage ſhould " be promoted to the utmoſt here, is derived from the " actual circumſtances of the empire at large.—Great " Britain, from the aſtoniſhing improvement of her " manufactures within the laſt fifty years, and the in- " creaſed number of hands employed in them, which " evidently argues an augmented population, is no " longer able to grow corn at home ſufficient for her " own conſumption.

Her average import during the three years, ending 5th January 1799, was as follows:

	£.	s.	d.			£.	s.	d.		Tons.
" Barley -	1	5	—	per quarter of	28 ſtone	91965	3	1	in weight	12875
" Beans -	1	5	—	——	32½ do.	27052	19	4	ditto	4396
" Indian Corn	2	10	—	——	32½ do.	18782	3	9	ditto	1526
" Oats at -	—	18	—	——	21¼ do.	607837	14	6	ditto	91808
" Oatmeal -	—	11	6	per Boll.	96½ lb. each	38157	5	9	ditto	2859
" Peaſe -	2	5	—	per quarter	32½ ſtone	54158	18	1	ditto	4889
" Rye -	2	—	—	——	32½ do.	117176	15	—	ditto	11900
" Wheat -	3	—	—	——	32½ do.	1668279	—	—	ditto	112956
" Ditto Flour	1	4	—	per cwt.	- -	96996	3	10	ditto	3791
				Total amount of imported corn		2714406	3	4	Total wt.	247000

" Nef

"Near two millions and three quarters of money "therefore have been annually ſent from Great Britain, "in the three years of moderate plenty preceding the "preſent, in order to pay for the 247000 tons of corn "ſhe has had occaſion for; of which there was ſup- "plied by Ireland only to the amount of 453,003*l.* "annually, which is no more than the ſixth part of "the entire demand. In years of ſcarcity, ſuch as "the preſent, a vaſtly greater ſupply is neceſſary; "and the entire importation of Great Britain, from "all the world, will not probably, this year, fall much "ſhort of the enormous ſum of eleven millions ſterling, "of which this country ſhall have contributed ſcarce "any thing at all*.

"Were Ireland then capable of exporting ſix times "more grain than ſhe does in plentiful years, and even "a hundred times more than ſhe can afford in years "of extreme ſcarcity, ſhe would readily find a market "for it in Great Britain. Now to undertake the long "and tedious voyages of the Baltic, the Mediterra- "nean, or North America, in order to look for wheat

* It appears by the foregoing ſtatement, that Great Britain has, in the courſe of four years, paid a ſum exceeding eighteen millions ſterling for corn imported, and that Ireland has not received quite one million out of the whole eighteen. The remaining ſeventeen millions may be conſidered as a bounty given by Great Britain to improve the agriculture, and increaſe the population and reſources of countries, in whoſe welfare the empire can have no intereſt; or in other words, thoſe ſeventeen millions have been expended in creating future armies and navies for nations, whoſe object is to rival the commerce, and may, perhaps, attempt to ſubdue the power of Great Britain.

"to

" to feed the Engliſh manufacturers, or, which is ſtill " worſe, to ſuffer the owners of that wheat to enjoy " the profits of its carriage, while almoſt entire pro- " vinces of this fertile iſland are allowed to continue " in a ſtate of nature, and merely to feed a few fat " bullocks or ſheep by the natural richneſs of the ſoil, " without the ſmalleſt attempt at cultivation; this is " ſuch a ſoleciſm in political economy, ſuch a violation " of the principles of all rational government, ſuch an " immenſe and reciprocal loſs to both iſlands, that it " is high time their reſpective governments ſhould ſeri- " ouſly turn their attention towards it.—To ſay that the " proviſion trade in cattle muſt needs ſuffer by the ex- " tenſion of agriculture here, and that ſalted proviſions " are as neceſſary to the empire as corn, is to frame " objections gratuitouſly, and without conſidering, that " by introducing here the improved modes of uniting " paſturage and tillage together, as practiſed in Great " Britain, each acre of our paſture land might be made " twice as productive as it now is, and that, upon the " whole, though tillage might be greatly encreaſed, " the quantity of beef, pork, and butter exported " would not be diminiſhed, and with regard to pork " particularly, which depends ſo much on agriculture, " its quantity would be prodigiouſly augmented.

" According to the imperfect modes of farming, pre- " valent among the Iriſh peaſantry, the average pro- " duce of a plantation acre of the different ſorts of " grain

" grain may be looked upon as equivalent to a ton
" weight. Ireland ſupplies nearly a ſixth part of the
" 247,000 tons of corn, by which quantity Great Bri-
" tain is deficient in years of moderate plenty, i. e. ſhe
" employs about 41,166 acres of her ſoil to grow corn
" for the Britiſh market. In order to enable her to
" ſupply that deficiency entirely, ſhe muſt employ ſix
" times more land, or 205,834 additional acres for
" the ſame purpoſe, according to the preſent rate of
" their produce; or if ſhe improves in the knowledge
" of farming, and that a ſmaller quantity of land will
" be ſufficient, ſtill the extenſion of tillage muſt be
" very conſiderable, that ſhall enable her to anſwer
" the entire demands of Great Britain.

" Let us now conſider, whether the conſtruction of
" navigable canals, to the extent already mentioned,
" would not operate ſufficiently to produce this de-
" ſirable effect.—The average rate of land carriage,
" in this country, is not at preſent leſs than one ſhil-
" ling per ton per mile, and the charge upon canals,
" if built at the public expence, need not be more, in-
" cluding the freight, than two-pence per ton per mile,
" and even much leſs in great diſtances, viz. ſuch
" a ſum as will ſuffice to pay the freight, and to
" keep them in repair. Suppoſing then, that the en-
" tire deficiency of corn, under which Great Britain la-
" bours, viz. 247,000 tons annually, were ſupplied
" from this country, and that each ton weight was

" obliged

" obliged to be carried twenty-four miles, on an aver-
" age, to the harbours moſt eligible for its exportation,
" and it will follow that the growers of theſe 247,000
" tons would gain annually ten-pence per ton for each
" of theſe twenty-four miles, by the ſubſtitution of ca-
" nals for land carriage, that is, they would gain
" twenty ſhillings a ton yearly in the exportation of
" the entire quantity, which is 247,000*l.* per annum,
" as a premium for agriculture; for if a ton weight is
" the produce of an acre of corn, the farmers of this
" country would thus have a bounty of twenty ſhil-
" lings an acre for the proſecution of their trade.—
" It is difficult to ſay, what would be a ſufficient en-
" couragement to agriculture, if twenty ſhillings an
" acre, annually expended upon it by the public, would
" not be a ſufficient inducement to active exertion.—
" Nor is it by any means extravagant to ſuppoſe, that
" each ton weight of grain would, on an average, re-
" quire to be carried twenty-four miles, before it reaches
" the place of its export, becauſe the harbours prefer-
" red for that purpoſe would either be Dublin, or
" ſome of the ports on the eaſt ſide of the iſland, op-
" poſite to Great Britain, to avoid the great expenſe
" and delay of a circuitous navigation by ſea.—If it be
" objected, that the price of corn would fall in the
" Britiſh market, or that the rents of corn-lands would
" riſe in this country in conſequence of the reduced
" price of carriage, ſo that the Iriſh farmer would not

" feel

" feel the benefit of it; it may be replied, that the de-
" mand of Great Britain ſeems to be conſtantly on the
" encreaſe, ſo that it is difficult to ſet any bounds to
" it; and though the rent of lands ſhould riſe, as no
" doubt it would, yet in the interval of time, until they
" come to the natural level, to which the new improve-
" ments would carry them, ſufficient encouragement
" would be held out to the growing of corn, though
" it ſhould not amount to twenty ſhillings an acre: even
" five ſhillings clear profit would be a ſufficient ſtimu-
" lus to convert, by degrees, to agriculture all the
" land, that would be neceſſary fully to ſupply the
" growing demands of Great Britain, which at the
" preſent rate of that demand would only require
" 205,000 acres more of the Iriſh ſoil to be converted
" to agricultural purpoſes.—But into whatever pockets
" the gain was ultimately diſtributed, ſtill it remains
" certain, that the country in general would ſave
" £.247,000 yearly, which, valued at twenty years
" purchaſe, may be eſtimated in round numbers at five
" millions of pounds ſterling.—Were Ireland then to
" convert only 205,000 acres more of her ſoil to til-
" lage than are at preſent employed in it, ſhe could
" afford to ſpend five millions ſterling in conſtructing
" canals neceſſary for the tranſport of corn to the ſea
" ſide, without loſing or gaining by the operation.—
" But if all the canals already enumerated could be
" made for a much leſs ſum than five millions; or if,

" when conſtructed, they would ſerve for an infinity " of other beneficial purpoſes, beſides the mere tranſ- " portation of grain; both of which aſſertions are " true in a moſt exceeding great degree, then it ap- " pears as clear as noon day, that this country cannot " poſſibly make too great exertions in this line, and " that, if a rage for any thing in any country is at all " excuſeable, it ought clearly to exiſt in Ireland in fa- " vour of canal navigations.

" Probably two, or at moſt three millions judiciouſ- " ly and faithfully expended, (in which indeed lies " the principal difficulty) would be amply ſufficient to " give this country all the extent already mentioned of " water communications.—The ſingle ſaving on the " carriage of exported corn, ſhould it ever amount to a " quantity ſufficient to ſupply the wants of Great Bri- " tain, of which there is every probability, would be " twice more than ſufficient to refund this ſum to the " nation, which on this article alone would therefore " gain two millions ſterling.—Every other uſe, to " which navigable canals can be applied, every other " benefit reſulting from them, is ſo much clear addi- " tional profit, for which credit may be taken in fa- " vour of the ſcheme.—But to enumerate theſe other " benefits and advantages, is really a taſk of the moſt " difficult and laborious kind, entirely reſulting from " the unbounded extent of the ſubject.—Beſides corn " for export, how many other ſpecies of bulky

" commodities,

"commodities, both native and foreign, muſt, the "former be carried out of, and the latter brought "into the very heart of this country, on all of which "a reduction of the rate of carriage, to one ſixth of "what it coſts at preſent, would afford the former "exceedingly cheaper to the conſumer at home, and "encreaſe the demand for the others abroad, by leſ- "ſening their demand in the foreign market.—Would "not the exchange of the native products and manu- "factures of the different parts of the iſland with each "other be extended and promoted in a ſtill higher de- "gree than its intercourſe, and that moſt beneficial of "all the branches of commerce, the inland trade of "the country, be thus quickened and revived in a moſt "ſurpriſing degree?—Would not the Iriſh manufac- "turer acquire much cheaper the materials, upon which "his induſtry is exerted, and the price of the manufac- "tured article remain nearly the ſame?—Would not his "application to his trade be thereby excited, and his "gains encreaſed?—Would not the circumſtance, of "our being able to ſupply other countries more cheaply "with the native articles we ſend to them, enable us "either to put the difference in our pockets, or to en- "creaſe the quantity produced by the growing compe- "tition for theſe profits?—In ſhort, it would be end- "leſs labour to enter fully into the particulars on this "fruitful ſubject, which embraces almoſt the entire "circle of intercourſe, which man holds with man."

The article before us is of ſuch importance to the welfare of this kingdom, that we have been induced to indulge ourſelves in an ample diſcuſſion of its merits, which we ſhall conclude with one ſhort remark, that the benefits, reſulting to a nation from a complete and extenſive inland navigation, are not confined to agricultural and commercial improvements only. Internal ſecurity, ariſing from the power of concentrating military force, is another happy effect of it. Ten thouſand men might be conveyed from Athlone to Dublin, to Limerick, or to Waterford, or *vice verſa*, together with their arms, baggage, and military ſtores, in one fourth of the time, which ſuch an army would take to arrive at thoſe places, even by forced marches; and if conveyed by water, they would be freſh and fit for immediate action as ſoon as they stepped on ſhore; and it is to be remarked that, as long as we poſſeſſed the interior of the country, an invading army could not avail itſelf of our navigations, as we could turn the water from the upper levels, and leave the bottoms of the canals dry; or if we retired from the coaſt, we might, if we thought fit, deſtroy the locks in our retreat, after we had uſed them. Ireland is the vulnerable part of his Majeſty's dominions; we conceive it to be impoſſible, that Government ſhould not ſee the wiſdom of ſtrengthening a country ſo likely to be aſſailed in every war with France, and we will venture to aſſert, that to poſſeſs the means of tranſporting

ing troops and military ſtores, with expedition and ſafety, from one end of the kingdom to another, is one of the moſt important features in the defence of a country.

ROYAL CANAL.

THE Royal Canal commenced under an act of parliament, and a charter from his Majeſty, in the year 1789. A ſubſcription was entered into by the company for 134,000*l.* and parliament granted 66,000*l.* making in the whole 200,000*l.* with a power of enlarging the ſubſcription on the capital ſtock to 500,000*l.* and with a power alſo of borrowing 500,000*l.*; making, in the whole, to be laid out on the works, one million of money.

Conſtitution and Management.

There are four general quarterly meetings of the corporation in each year, who have a controuling power over all the affairs of the Company: each proprietor of ſtock, to the amount of ſix hundred pounds, is eligible to vote at ſuch meeting; and every proprietor is entitled to vote, for every ſix hundred pounds ſtock he is poſſeſſed of, ſo far as three thouſand pounds.

The

The general management of the Company's affairs is in the hands of a court of directors, conſiſting of twenty-one members, annually elected by the Company, from thoſe who are proprietors of at leaſt twelve hundred pounds ſtock; and no money can be drawn from the treaſurer, without a warrant ſigned at public meetings by five of ſaid directors.

Extent and Progreſs.

This canal is intended to proceed to Tarmonbury on the river Shannon, with off branches to ſuch market towns, or other places, as may ſeem expedient. Twenty-two miles of navigation have been completed, viz. from the river Liffey at Dublin to Newcaſtle, weſt of the Nineteen-mile houſe, on the Mullingar road, and boats ply regularly every day. From Newcaſtle to Griffinſtown, one mile and a half beyond Kinnegad, being thirty-three Iriſh, or forty-two Engliſh miles from Dublin, the canal is nearly completed, and a conſiderable progreſs has been made in the remainder of the line to Mullingar.

Conſtruction of Canal, and Articles of Trade.

The ground, through which the canal runs, is ſo favourable, that one level is ſix miles in length, another ſixteen, and the ſummit level is expected to be ſeventeen

teen Iriſh miles in extent, without a lock, into which the grand ſupply of water comes from Lough Owel near Mullingar. The conſtruction of the canal is of the moſt perfect kind; the locks are eighty feet clear pool in length, and fourteen in breadth; the banks ſloping twenty inches for each foot they riſe. The trading-boats carry from eighty to an hundred tons burden; the paſſage-boats are elegant and commodious.

The great quarries, through which the canal has been carried with much labour and vaſt expence, near Caſtleknock, afford immenſe quantities of limeſtone, building-ſtone, and marble, which bear a much higher poliſh than Italian; all which ſtones are fully adequate to the demands of the city of Dublin for many years. Over the Rye-water, near Leixlip, an aqueduct has been formed, far exceeding in magnitude any work of that nature in Europe. A communication is formed from the canal to the North-wall, eaſt of the Cuſtom-houſe, where a ſea-lock is intended to be ſhortly opened, to connect the canal with the river Liffey and the ſea. From the direction of this canal, running N. W. from the city into the heart of the country, through which at preſent immenſe quantities of goods are carried, great advantages muſt ariſe from the cheapneſs of ſtill-water carriage; but the national benefit muſt riſe ſtill higher when it reaches the Shannon, as coals, manufactured iron, clays, and ores of various kinds, will then come from the counties of

Roſcommon

Roſcommon and Leitrim; and turf, ſtones, bricks, mill-ſtones, &c. &c. will alſo be thereby conveyed to Dublin on eaſy terms.

Quantity and command of Water.

The waters, which at preſent ſupply the Royal canal, are the rivers Lyre at Larabryan, the Augher and Rye-water at the bog of Cappa, together with ſome ſmall ſtreams taken in, in its courſe from Dublin to Newcaſtle; but the great command of water will be obtained from Lough Owel, on the ſummit level near Mullingar. The water from this extenſive lake at preſent flows nearly in equal quantities from each end; the north-weſt end falling rapidly into Lough Iron, and from thence to the river Inny: the ſtream from the ſouth-eaſt end runs through Cullienmore, where it turns a mill already purchaſed by the Royal Canal Company, and is the head of the river Bruſna. As the ſummit level is propoſed to be from five to ſix feet lower than the ſurface of this great lake, the whole waters of thoſe two rivers may be drawn into the canal; therefore there can be no heſitation to pronounce that, in that caſe, no canal in his Majeſty's dominions can boaſt of ſo good a ſupply.

Height

Height of the ſummit level above the ſea.

	Feet.
From high-water mark, at ſpring tides, to the Broad-ſtone level, - - -	62
To Kilcock, - - - - -	141
To the long level at head of 18th lock, -	34
	237
To level above 25th lock at Baltreſna (ſummit level), - - - - -	70
Height of ſummit level, from high-water mark, above the ſea, - - -	307

In addition to the grant of 66,000*l.* already mentioned, parliament, in the year 1798, granted the further ſum of 25,000*l.* of which 11,000*l.* remains to be received by the Company; and in the year 1801, when it was propoſed by the Directors General of inland navigation, appointed by parliament, with a laudable zeal for the public good, to reduce the tolls on canals, the Company, influenced by the ſame public ſpirit, and foregoing the proſpect of exorbitant profit to a few individuals, without affording a proportionate benefit to the community, and particularly to the inhabitants of Dublin, after the moſt ſolemn deliberation upon this important ſubject, agreed to a reduction on the following articles, viz.

For every ton weight, per mile, upon all goods, merchandizes, or commodities whatſoever, from 3*d.* to 2*d.*

For every ton weight of corn and grain, meal, malt, and flour, from 1½*d.* to 1*d.* Potatoes, lime, ſand, fuel, manure, iron wrought or unwrought, and all military bodies, with baggage, arms, ammunition, and cannon on their route, per mile, from 3*d.* to 1*d.*

And for every ton weight of potatoes brought to Dublin, per mile, from 3*d.* to one halfpenny.

But there is every reaſon to believe, that the conſequent increaſe of trade, on the canal running through ſo fertile and populous a country, will amply compenſate the company for this apparent ſacrifice in the reduction of their tolls.

On the aforeſaid terms the Directors General granted them an aid of 95,866*l.* 7*s.* 10*d.* for the purpoſe of completing the canal to the end of the ſummit level at Coolnahay, ſix miles and a half beyond the town of Mullingar in the county of Weſtmeath, being a diſtance of forty-ſix Iriſh, or ſixty Engliſh miles from Dublin. This grant from Parliament, and alſo a loan of 100,000*l.* raiſed by the Company, ſuddenly changed the appearance of their affairs, and enabled them to proceed in this great national work with unexampled ſpirit and rapidity. At preſent no leſs than between three and four thouſand men are in conſtant employment

ment on the line; and it is confidently expected that, in leſs than two years, a navigable canal will be fully completed from Dublin to Lough Owel.

In addition to the certain and inexhauſtible ſupply of water, which this immenſe lake will afford to the canal, a conſiderable advantage may accrue to the Company from ſupplying the north ſide of the city of Dublin with water.

IMPROVED BREEDS

OF

LEICESTERSHIRE COWS AND PIGS.

I HAVE been favoured with the annexed drawings of cows and pigs by George Grierſon, Eſq. of Rathfarnham Houſe, in the county of Dublin. They have been drawn from the life by Mr. J. Brocas of the city of Dublin, a young profeſſor of very promiſing talents. The cows are of the improved Leiceſterſhire breed, ten of which Mr. Grierſon purchaſed from Mr. Aſtley of Oddſton Hall, in Leiceſterſhire, at a very conſiderable price: they have been bred from the Bakewell famous ſtock of Diſhley, in Leiceſterſhire, to the improvement of which he devoted his entire attention for forty years, with as yet unexampled judgment. Their great

great merit conſiſts in the fineneſs of their offal, and their wonderful propenſity to fatten at an early age, at the ſame time that they are excellent milchers. The pigs are alſo of the improved Leiceſterſhire breed, purchaſed from the ſame gentleman. They likewiſe poſſeſs the quality of fattening in a ſhort time, on very little keep, and to a wonderful weight.

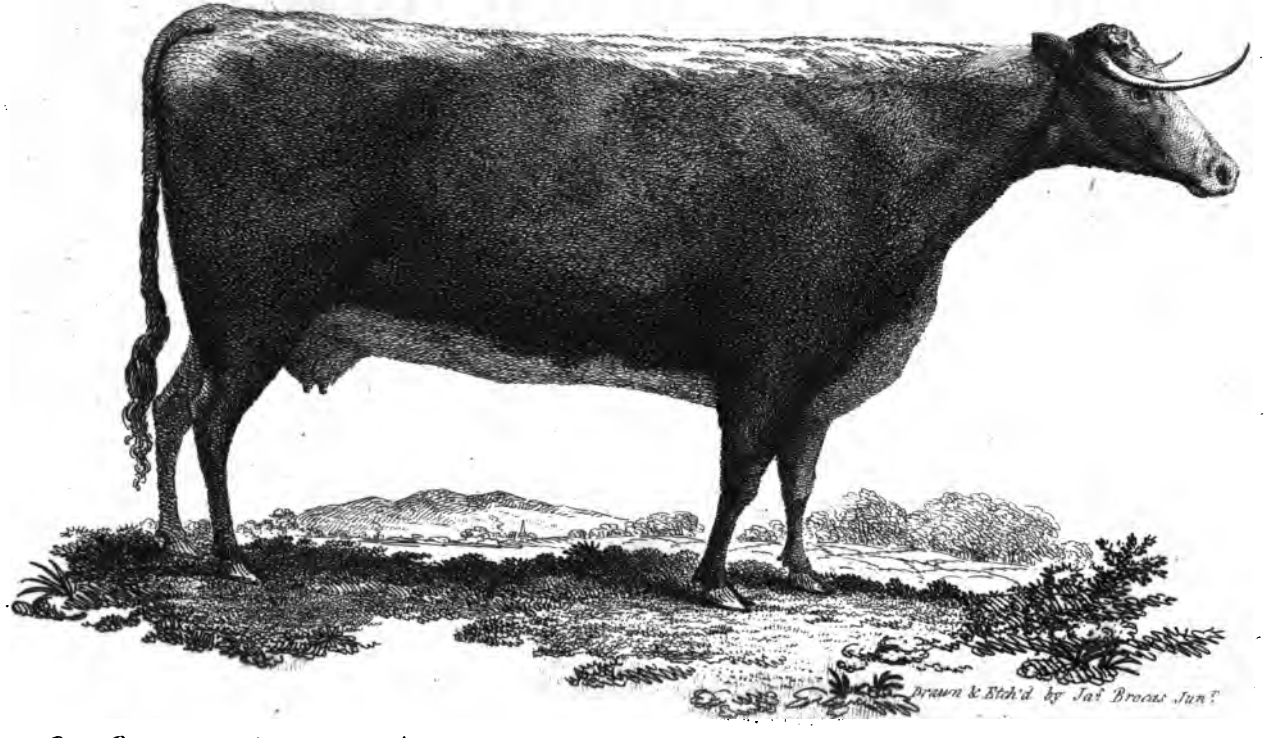
It muſt give great pleaſure to every real lover of his country, to anticipate the amazing improvement, which the importation of ſuch cattle muſt, in a few years, make in the general ſtock of the kingdom. Mr. Grierſon has ſeveral moſt beautiful bull and heifer calves from theſe cows, by the beſt Shakeſpear bull he could hire in England; and many other gentlemen have brought over the beſt cows they could procure in England, and have been equally ſucceſsful in South-Down ſheep. One practice of Mr. Grierſon I ſhall take the liberty of recommending to general notice. He lets his boar to a ſmall farmer or labourer, for his choice of one pig of the litter at ſix weeks old, though he gets a guinea from men of property. This practice muſt do infinite ſervice in improving our breed of pigs, which is the poor man's only ſtock, and generally the ſtock of every poor man.

Mr. Culley, in his Treatiſe on Live Stock, gives an account of a pig, that was killed at Congleton in Cheſhire, which meaſured, from the noſe to the end of the tail,

tail, three yards, eight inches; in height it was four feet and a half; and weighed, when dead, eighty-ſix ſtones, eleven pounds, or 1215 pounds.*

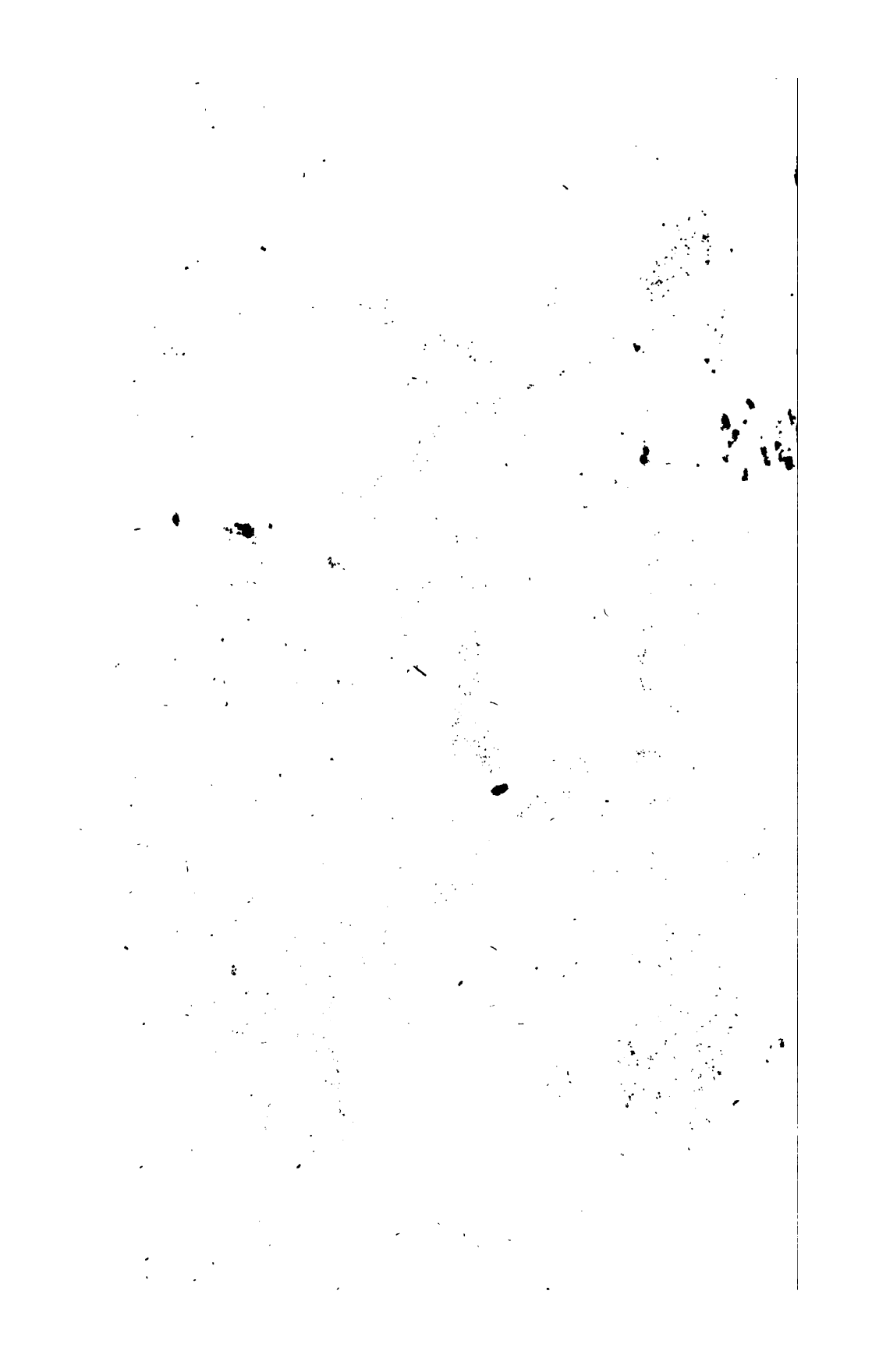
* Vide Hiſtory of Quadrupeds, publiſhed 1792, page 148.

London Publish'd



Drawn & Etch'd by Jas Brocas Junr

By a Bull call'd G. N. by Garrick out of Nell. bred by Mr Fowler of Rollright & her Dam of true Dickley blood.

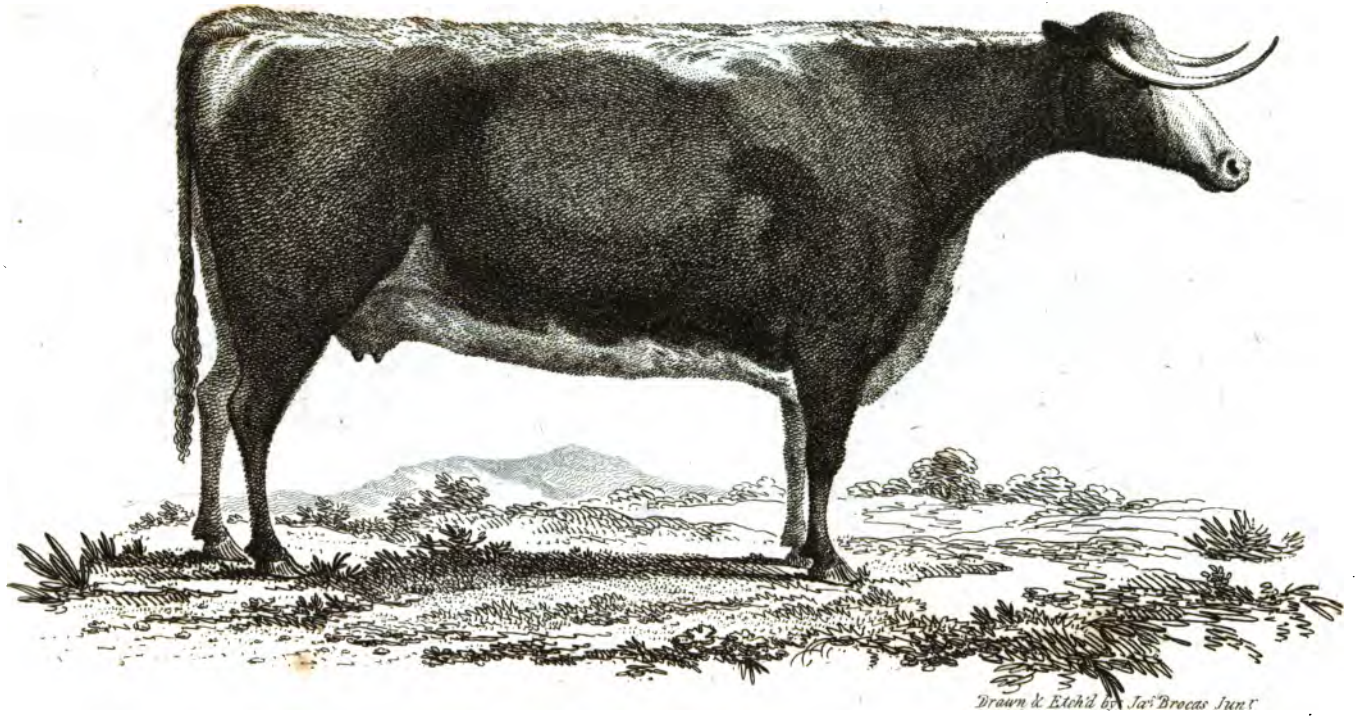


MIGNIONETTE

Drawn and Etched by
Broccas junior

By Dishley Dout of a Cow by Dishley P.

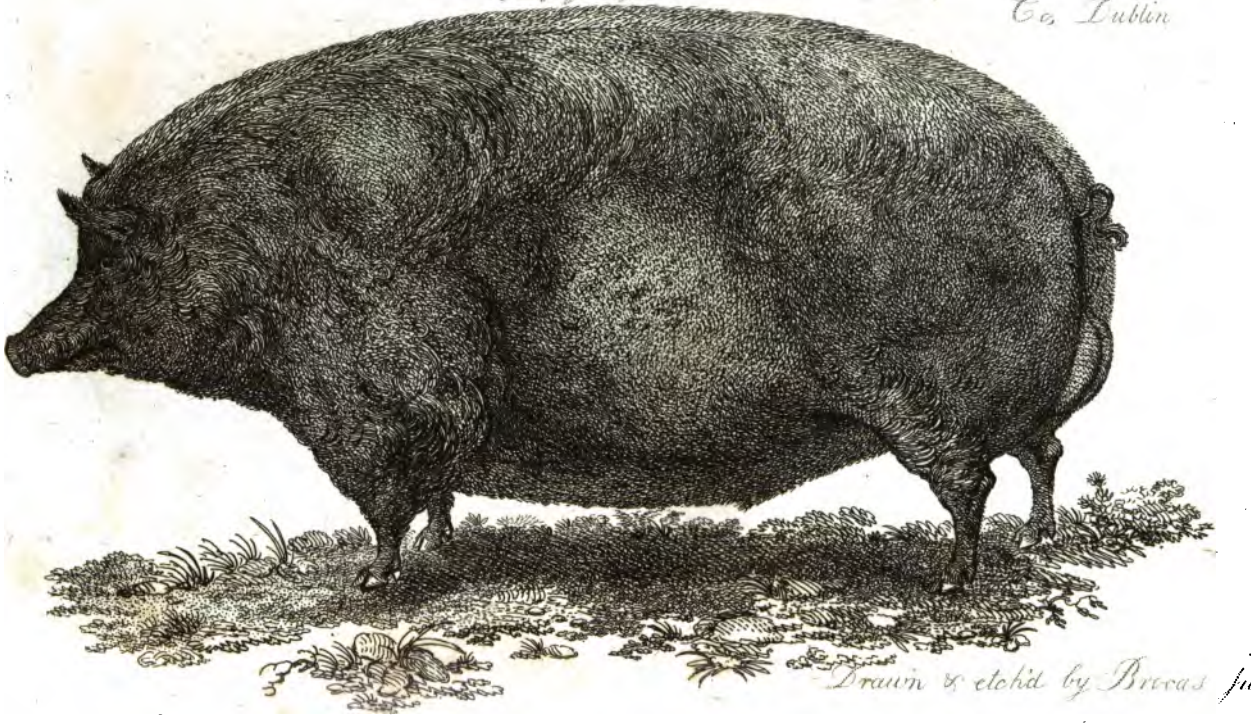
The Property of Geo. Grierson Esq.r Rathfarnham House Co. Dublin



By a well bred Son of Shakespear out of a Cow by a Son of Washingtons Dam alias Lady Washington.

A Boar of the improvd Leicestershire breed

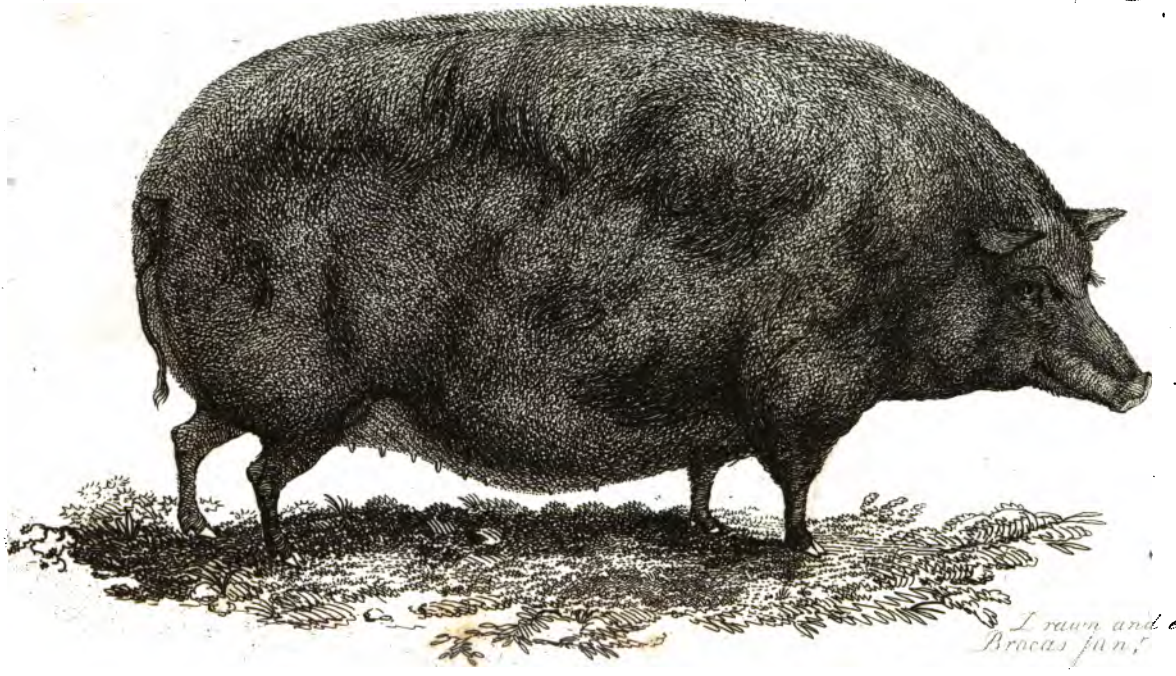
The property of Geo. Grierson Esq.r Rathfarnham House Co. Dublin



Drawn & etch'd by Brocas jun.r

A Sow of the improv'd Leicestershire breed

The property of Geo. Grierson Esq.r Rathfarnham House Co. Dublin



Drawn and etchd by Bracas jun.r

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